

#24

Cellular Expression of β_2 AR- β gal $\Delta\alpha$ Fusion Protein in C2 Clones
(measured by anti- β -gal ELISA)

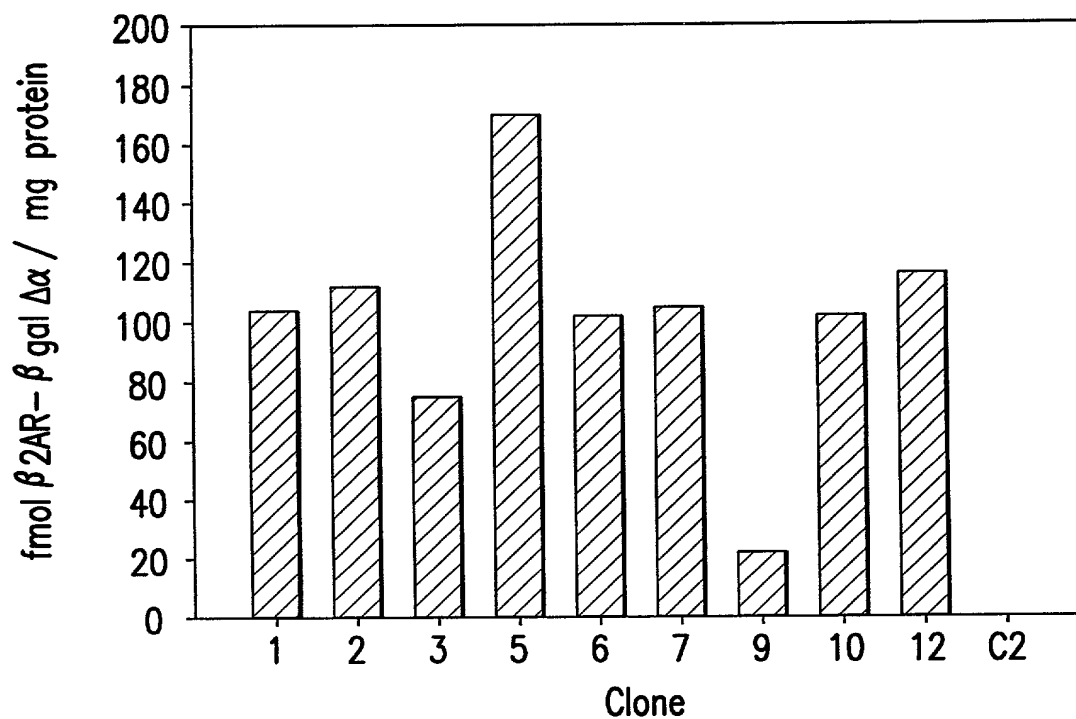


FIG. 1A

Cellular expression of β Arr- β gal $\Delta\omega$ fusion protein in C2 clones
(measured by anti- β gal ELISA)

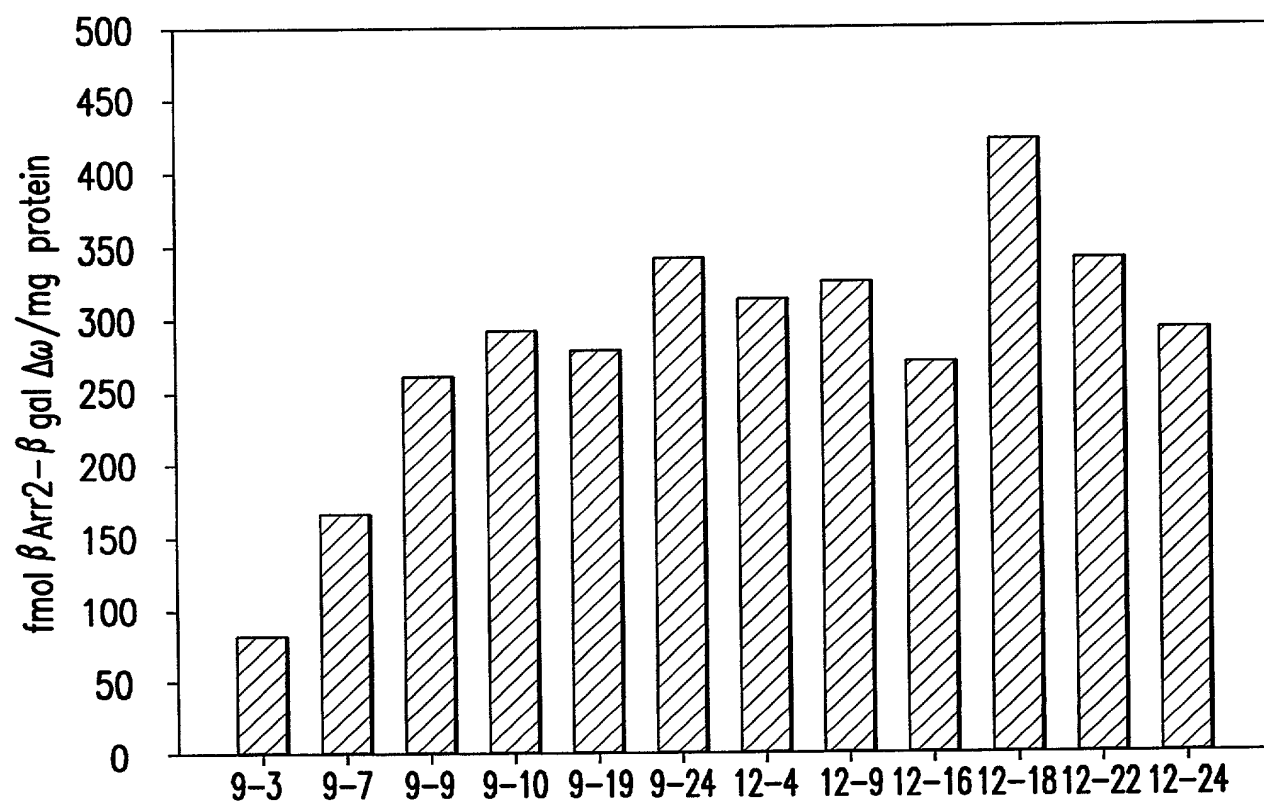


FIG. 1B

Agonist Stimulated cAMP Response in C2 Cells Expressing $\beta 2AR-\beta gal\Delta\alpha$

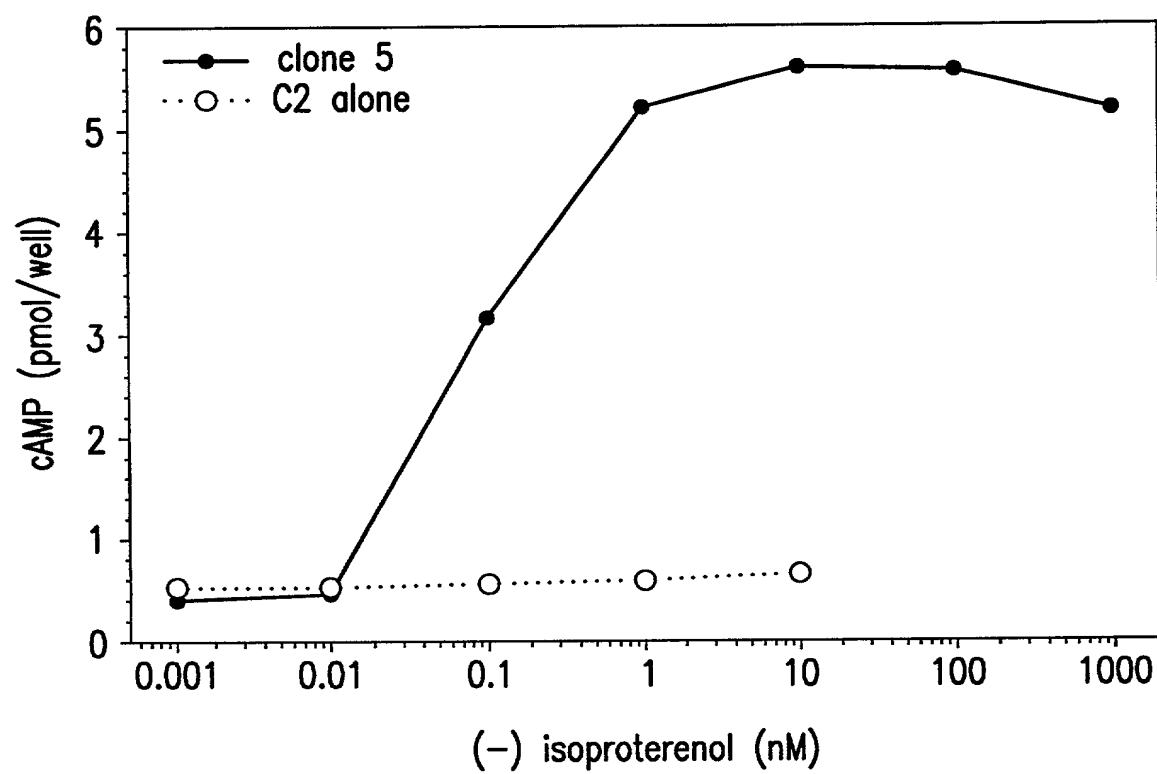


FIG.2

β -galactosidase Complementation as a Measurement for β_2 AR- β gal $\Delta\alpha$ interacting with β Arrestin2- β gal $\Delta\omega$ upon agonist Stimulation

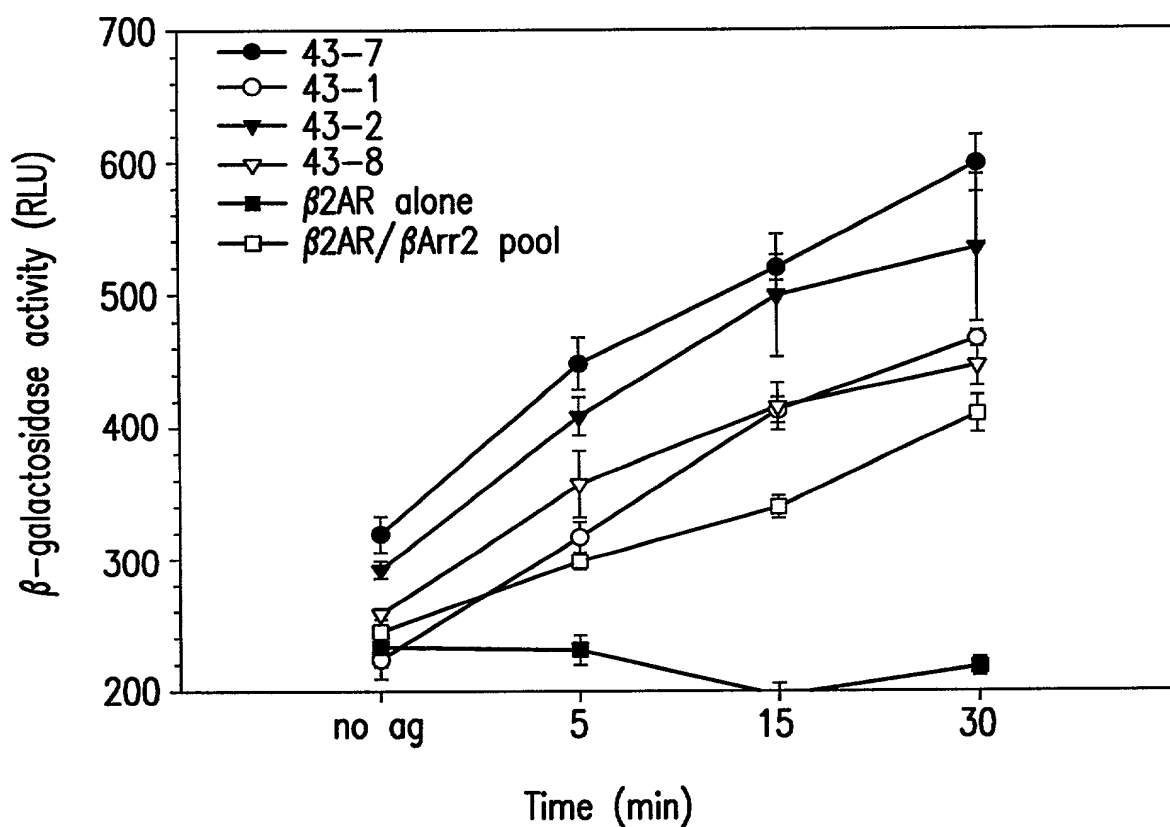


FIG. 3A

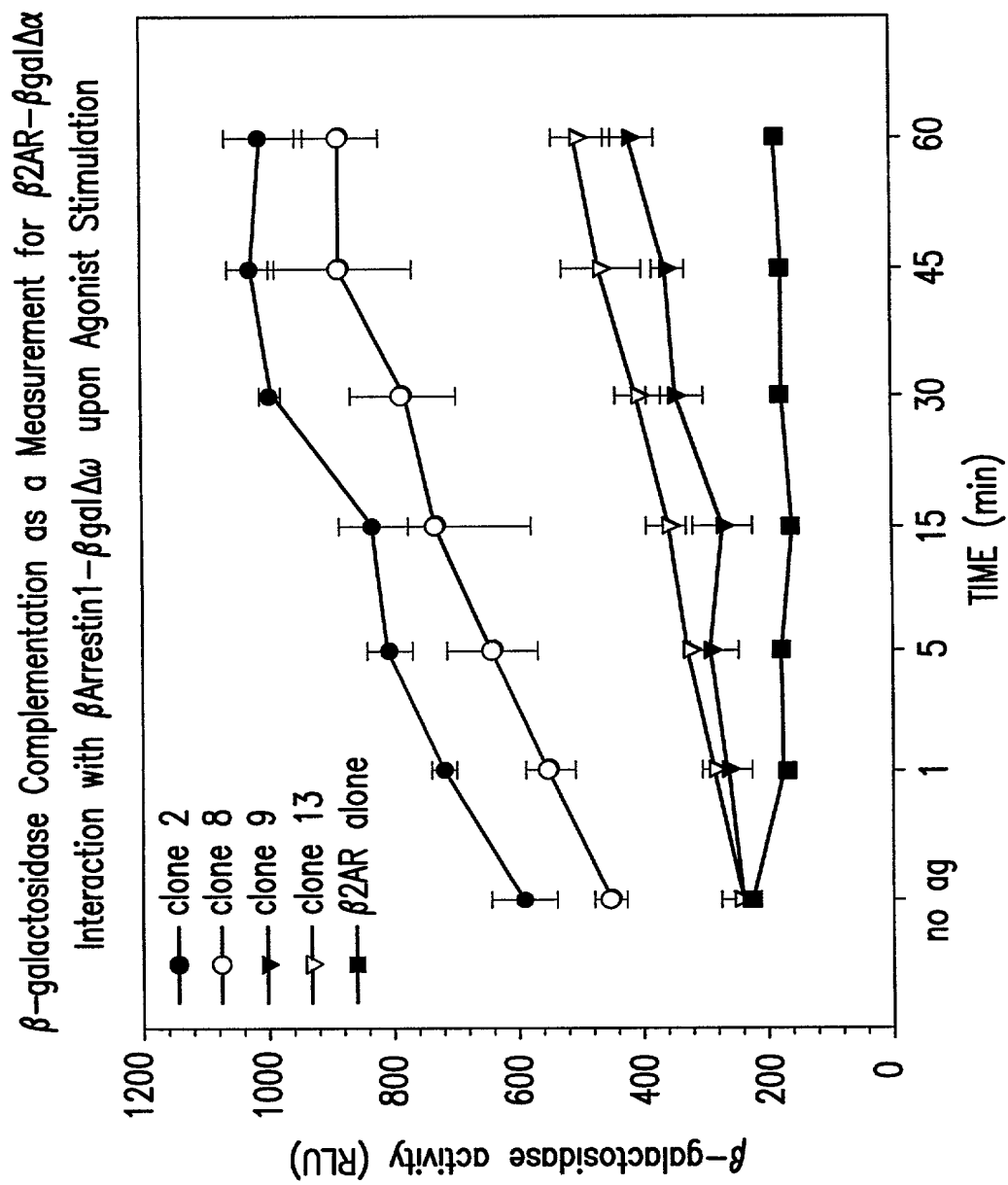


FIG. 3B

β -galactosidase Activity in Response to Agonist in C2 Cells
Coexpressing β 2AR- β gal $\Delta\alpha$ and β Arrestin2- β gal $\Delta\omega$ Fusion Proteins

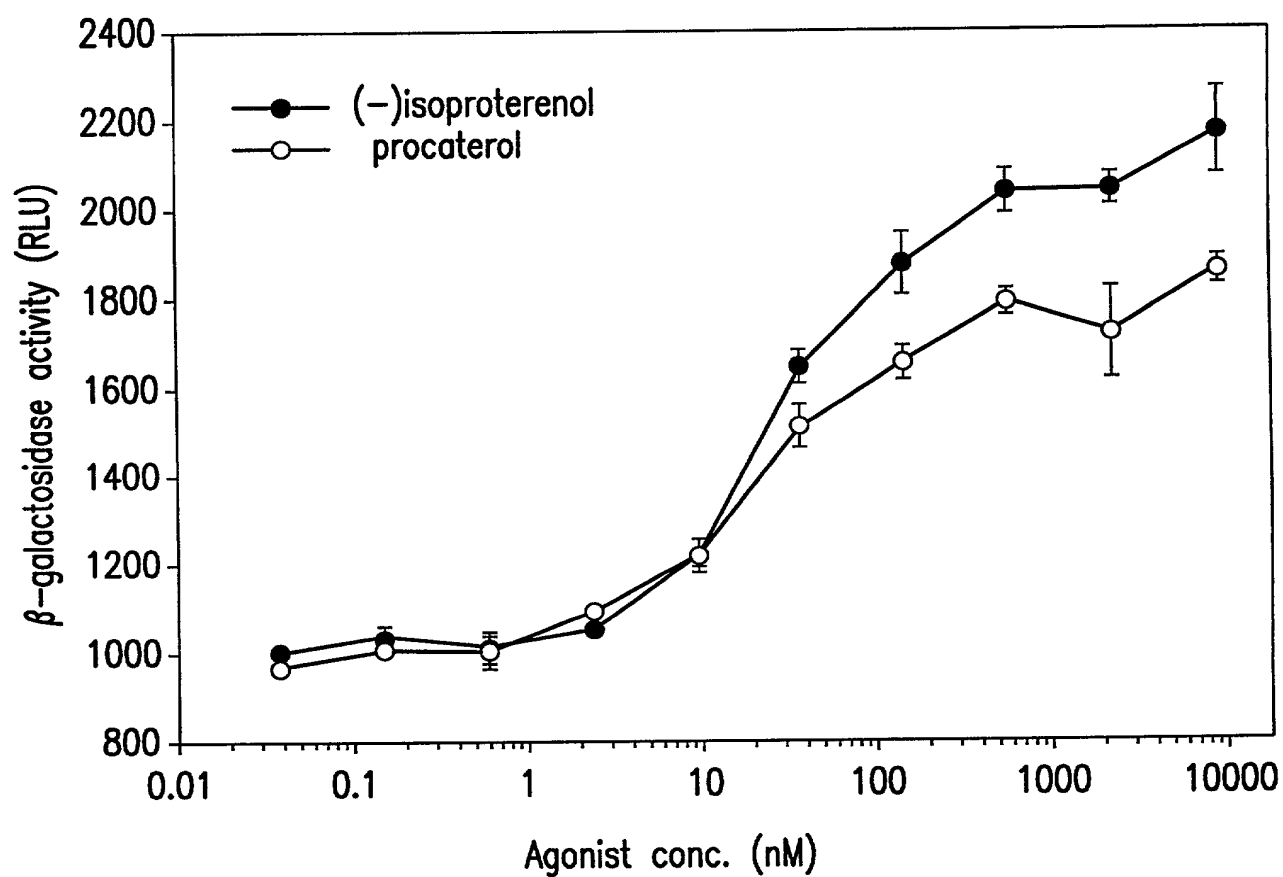


FIG. 4A

β -galactosidase Activity in Response to Agonist in C2 Cells
Coexpressing β 2AR- β gal $\Delta\alpha$ and β Arrestin1- β gal $\Delta\omega$ Fusion Proteins

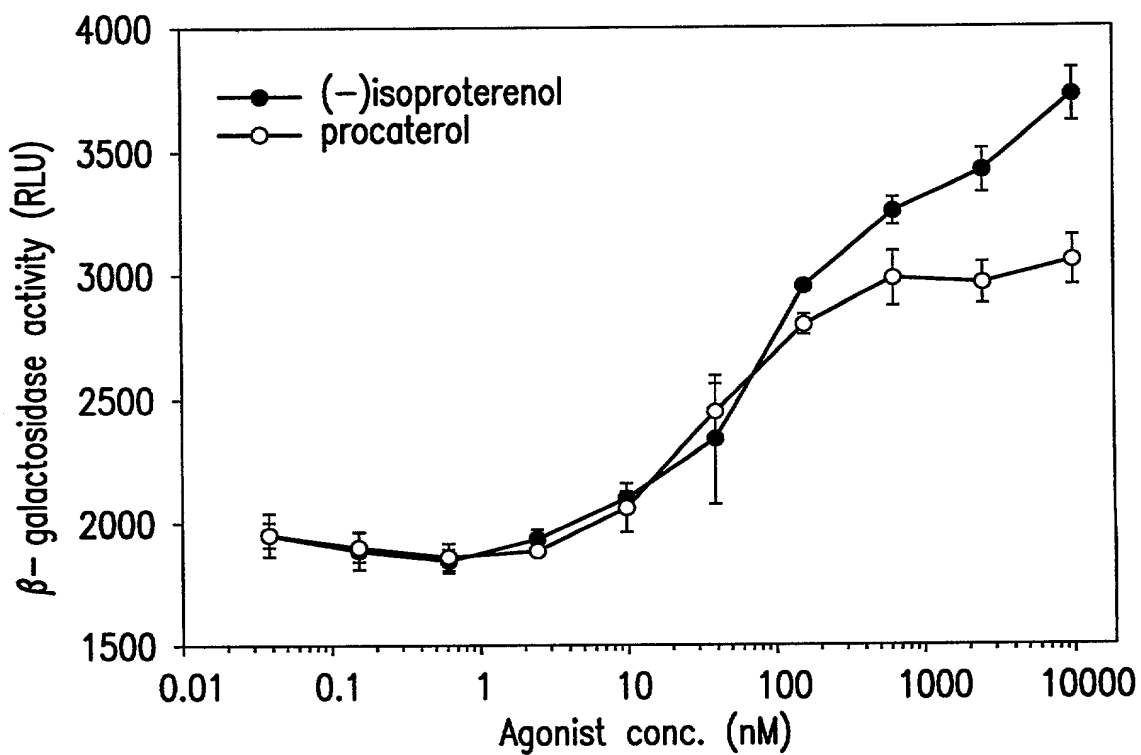


FIG. 4B

Inhibition of β -galactosidase activity in C2 Cells Coexpressing β 2AR- β gal $\Delta\alpha$ and β Arrestin2- β gal $\Delta\omega$ Fusion Proteins

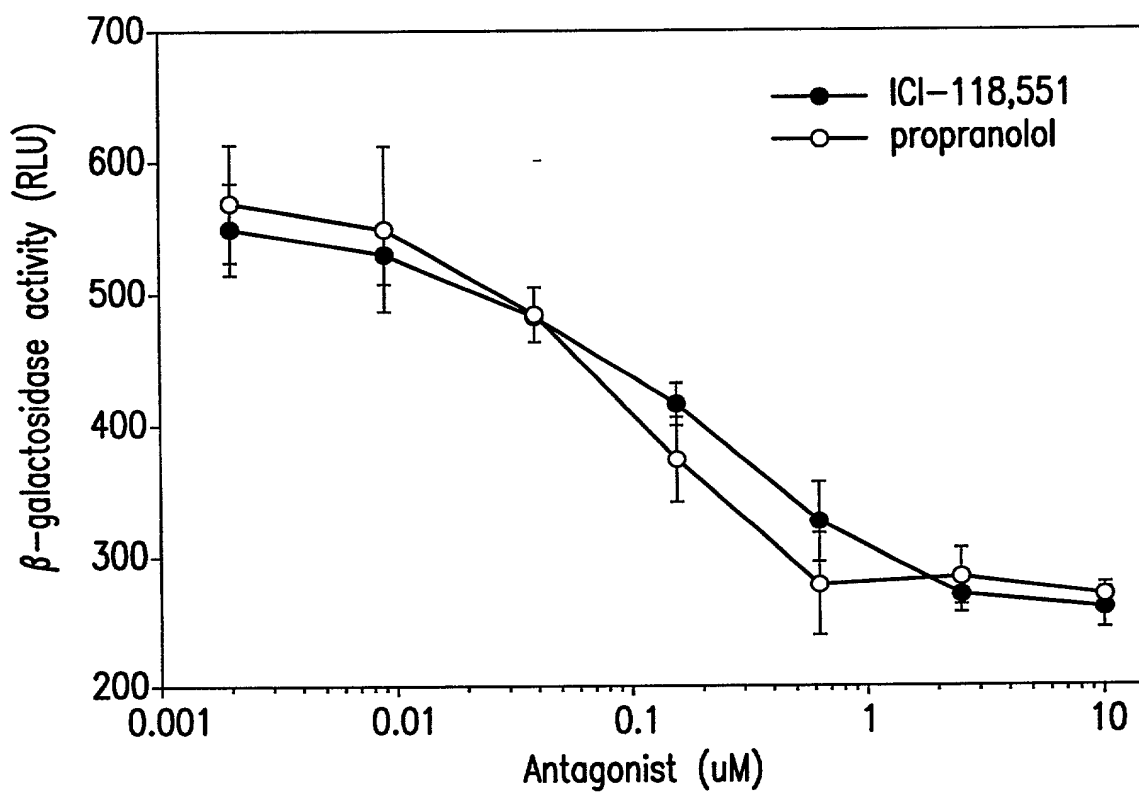


FIG. 5A

Antagonist Inhibition of β -galactosidase Activity in C2 Cells
Coexpressing β 2AR- β gal $\Delta\alpha$ and β Arrestin1- β gal $\Delta\omega$ Fusion Proteins

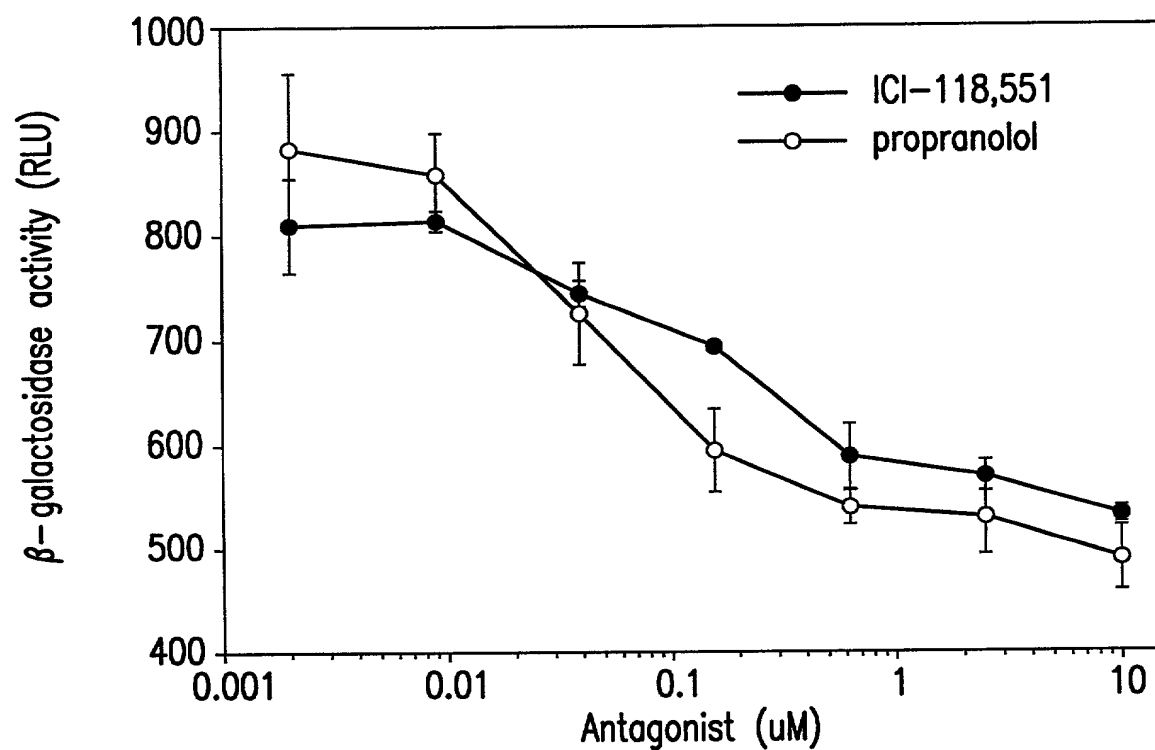


FIG. 5B

Agonist Stimulated cAMP Response in Clones or Pools of C2 Cells
Coexpressing A2aR- β gal $\Delta\alpha$ and
 β Arrestin1- β gal $\Delta\omega$ Fusion Proteins

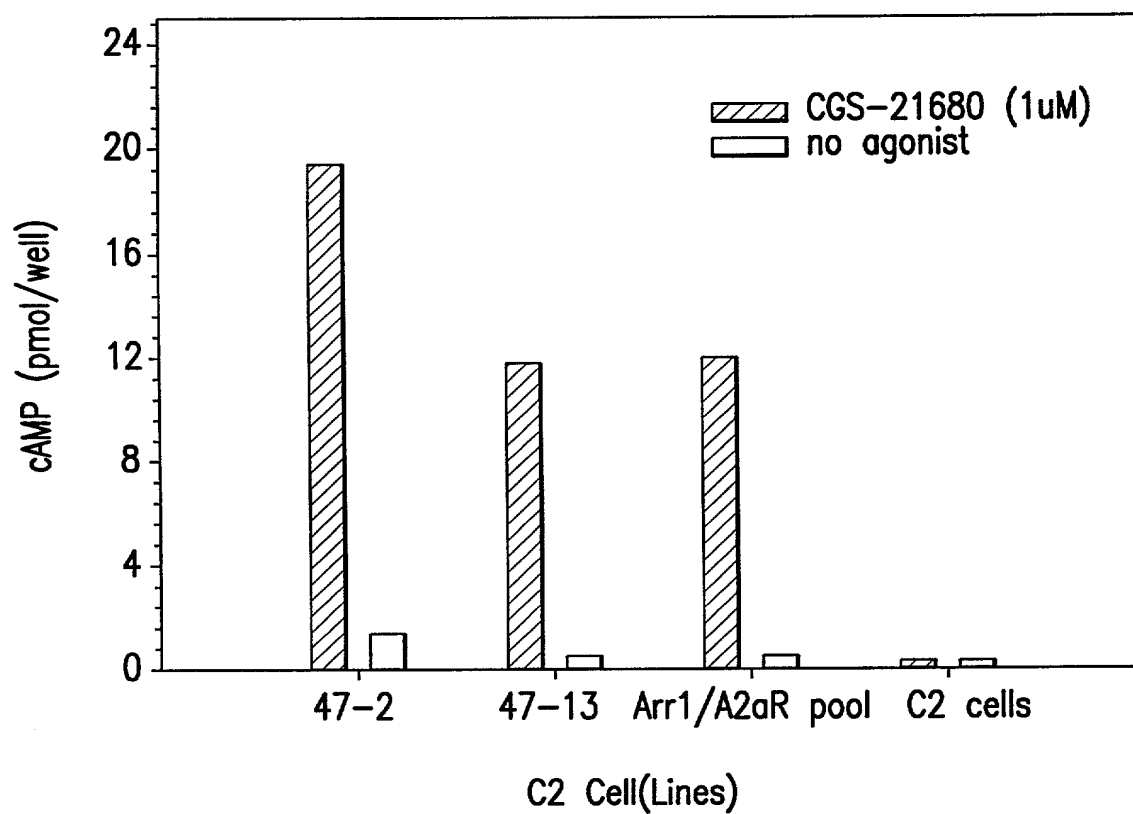


FIG.6

Agonist Stimulated cAMP Response in Clones or Pools of C2 Cells
Expressing D1- β gal $\Delta\alpha$ and β Arrestin2- β gal $\Delta\omega$ Fusion Proteins

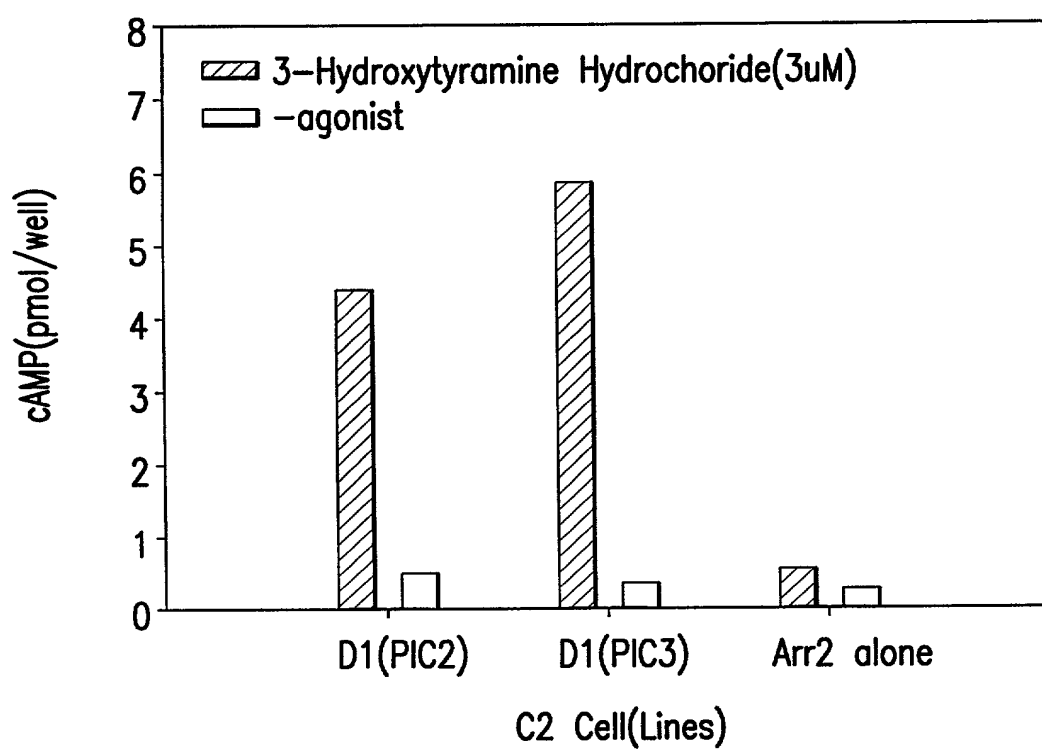


FIG. 7

$\beta_2AR-\beta gal\Delta\omega$ and $\beta arr2-\beta gal\Delta\alpha$ Interaction in HEK293
Clones in Response to Isoproterenol Treatment ($1\mu M$)

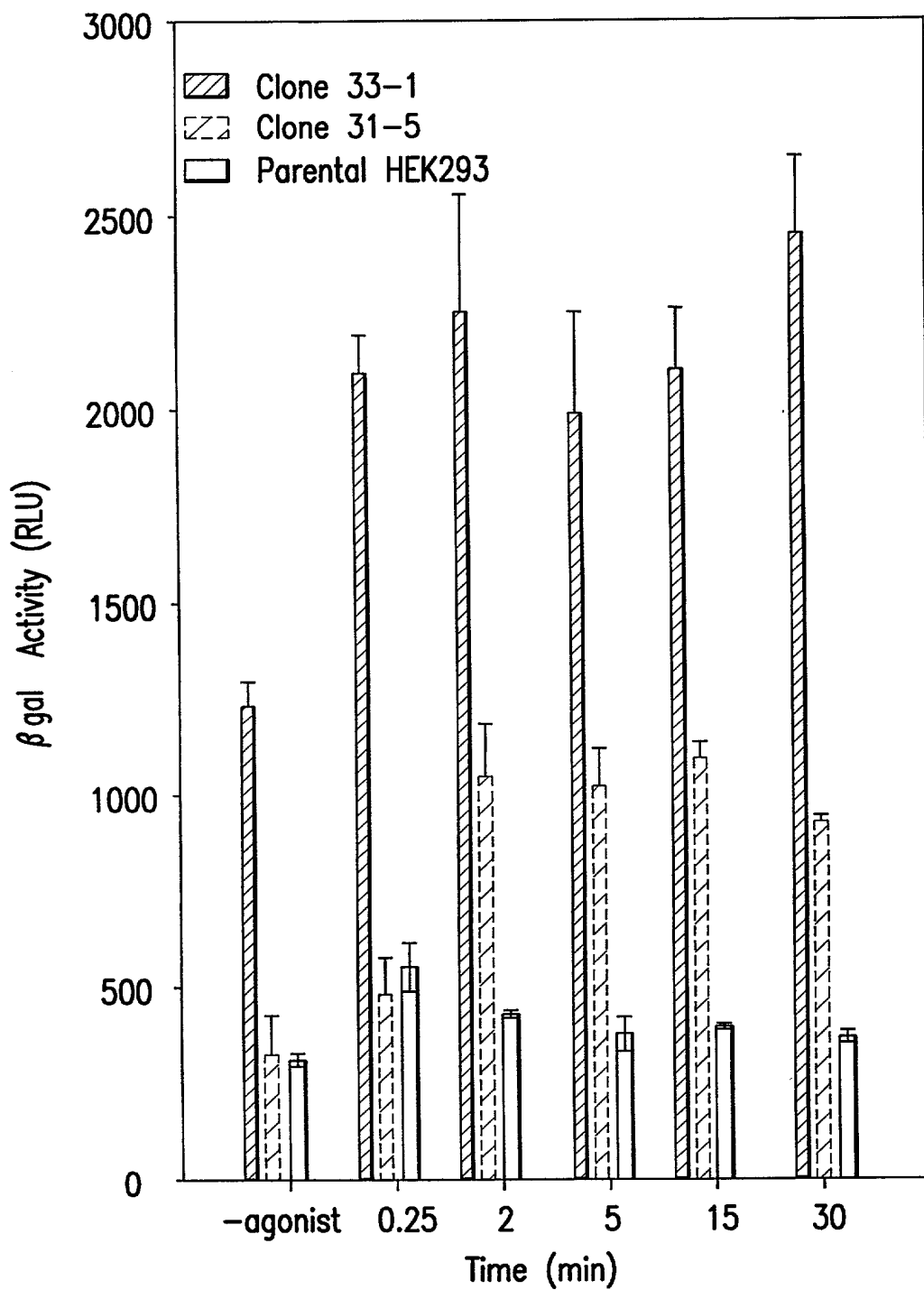


FIG. 8A

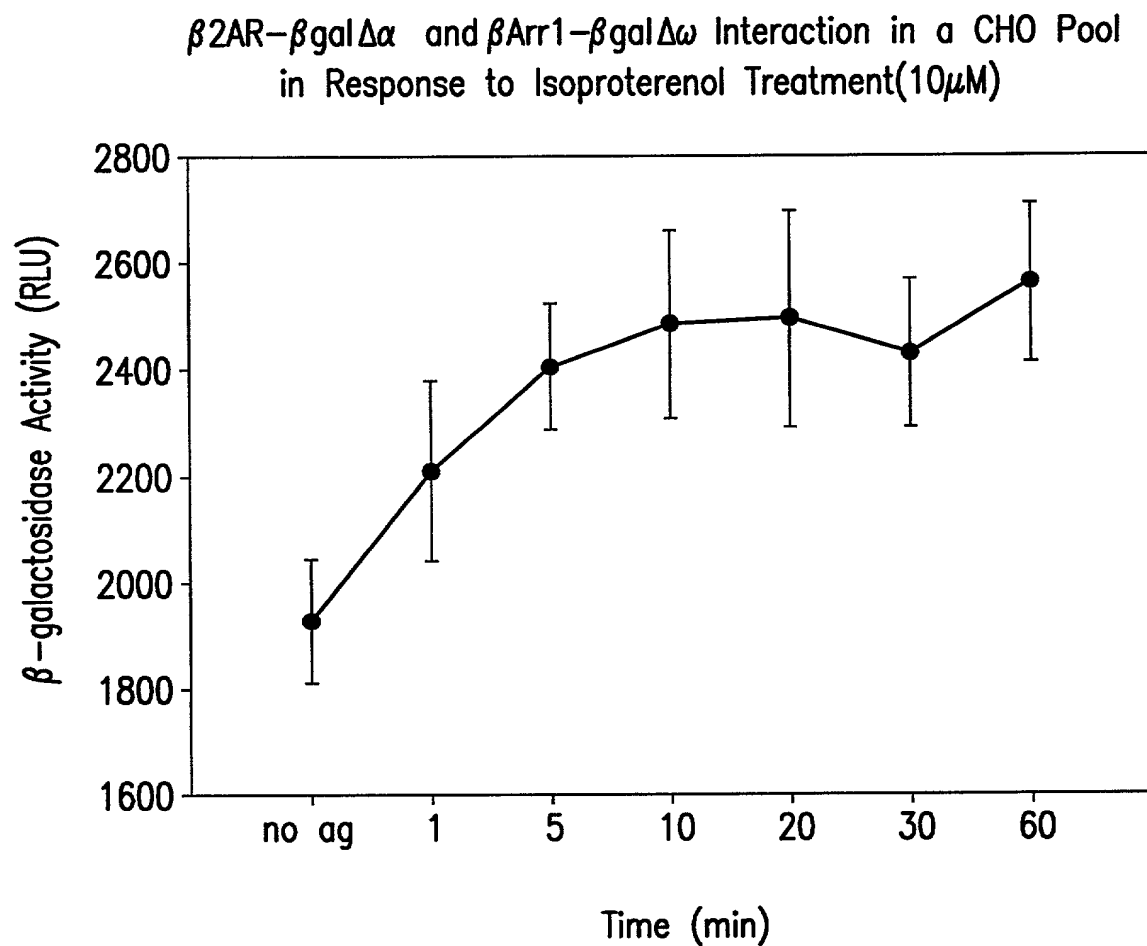


FIG. 8B

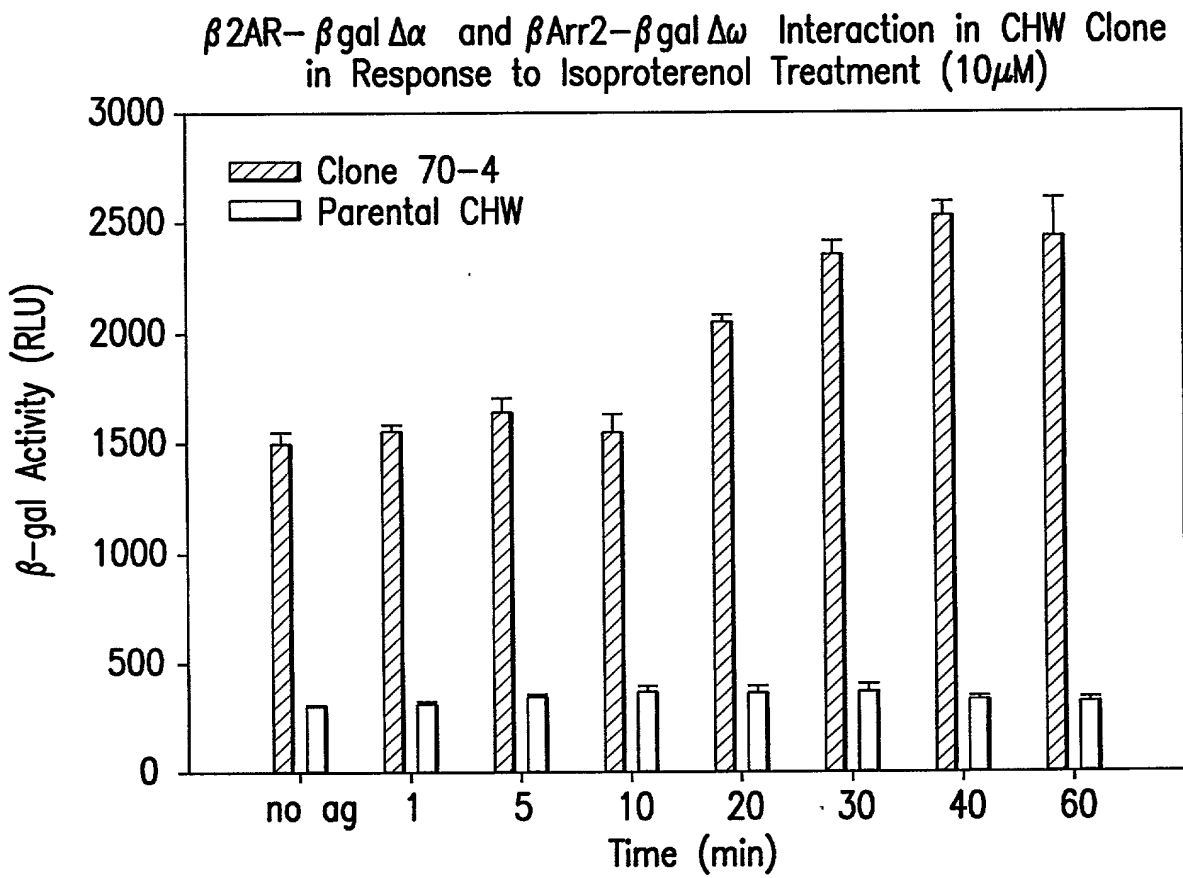


FIG. 8C

β -galactosidase Complementation as a Measurement for
Adrenergic Receptor Homodimerization in HEK 293 Cells
Coexpressing β 2AR- β gal $\Delta\alpha$ and β 2AR- β gal $\Delta\omega$.

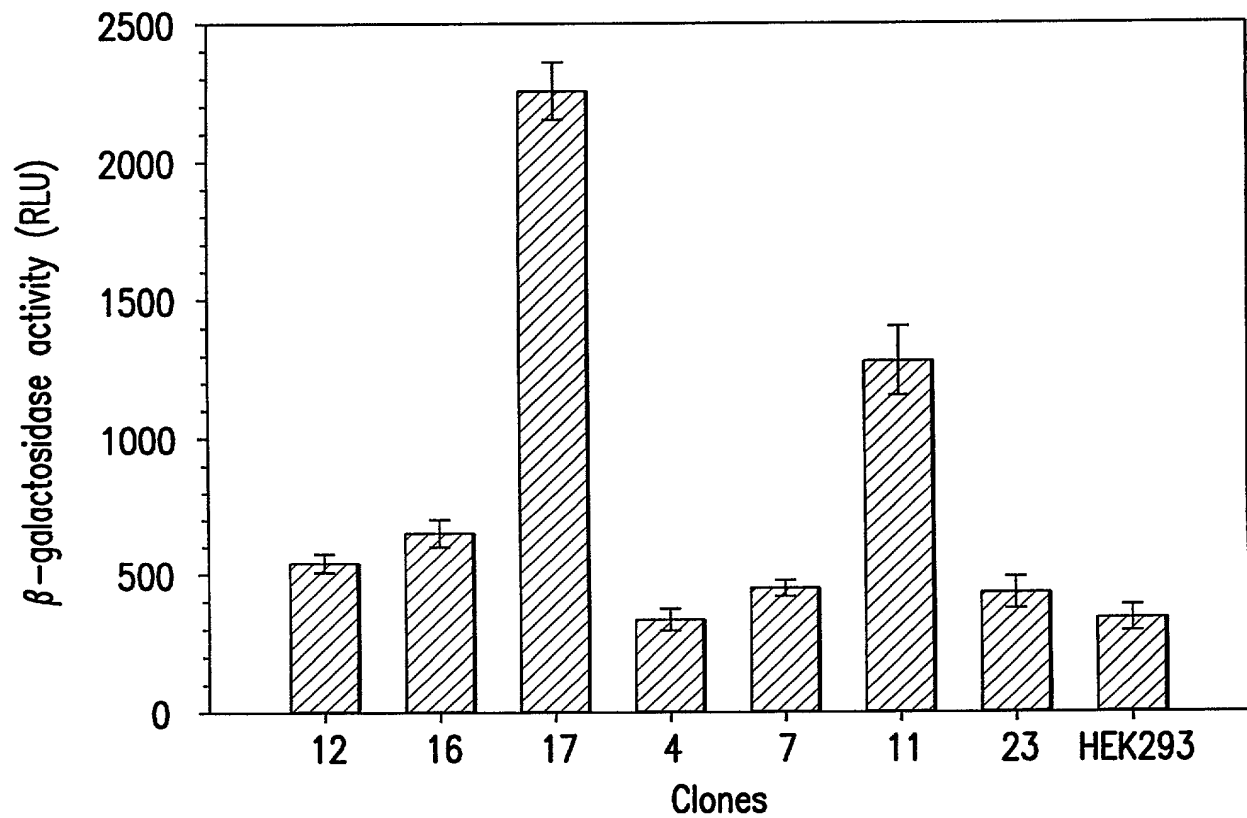


FIG. 9A

Agonist Stimulated cAMP Response in HEK 293 Cells
Coexpressing $\beta 2AR-\beta gal \Delta\alpha$ and $\beta 2AR-\beta gal \Delta\omega$

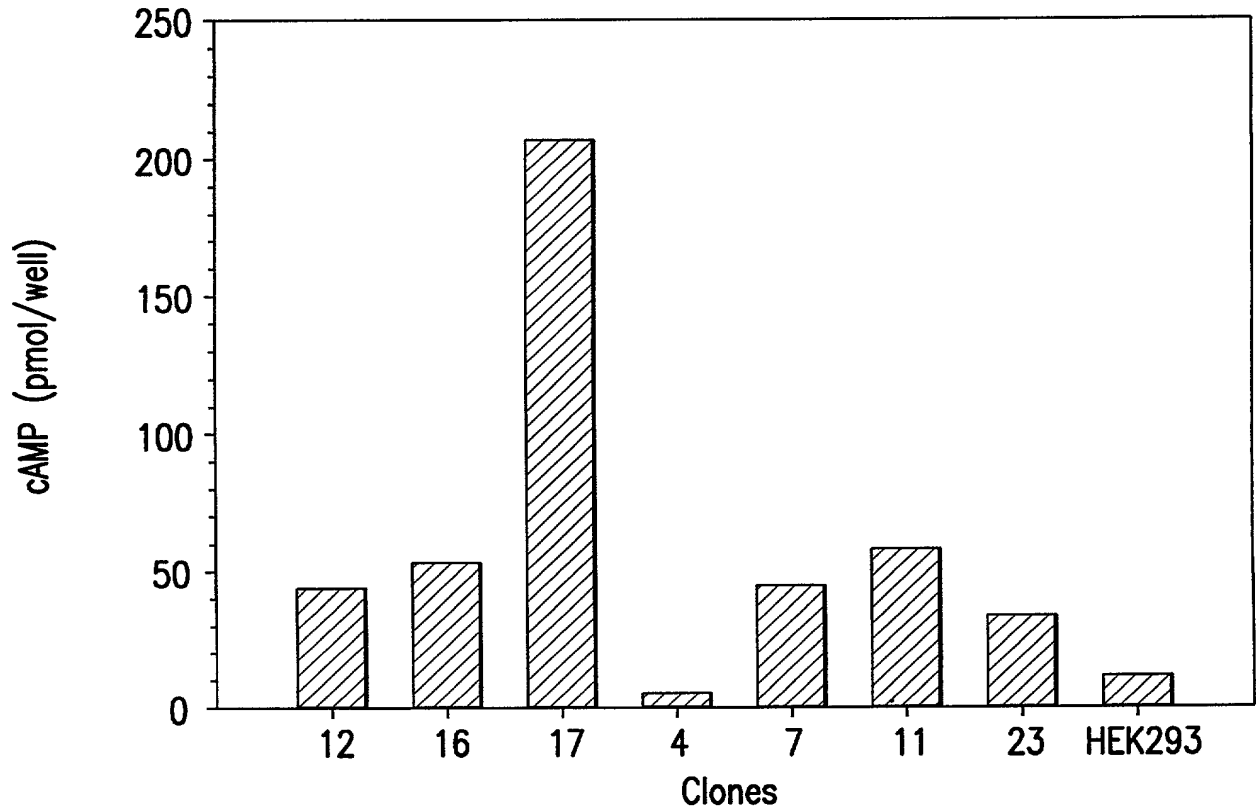


FIG. 9B

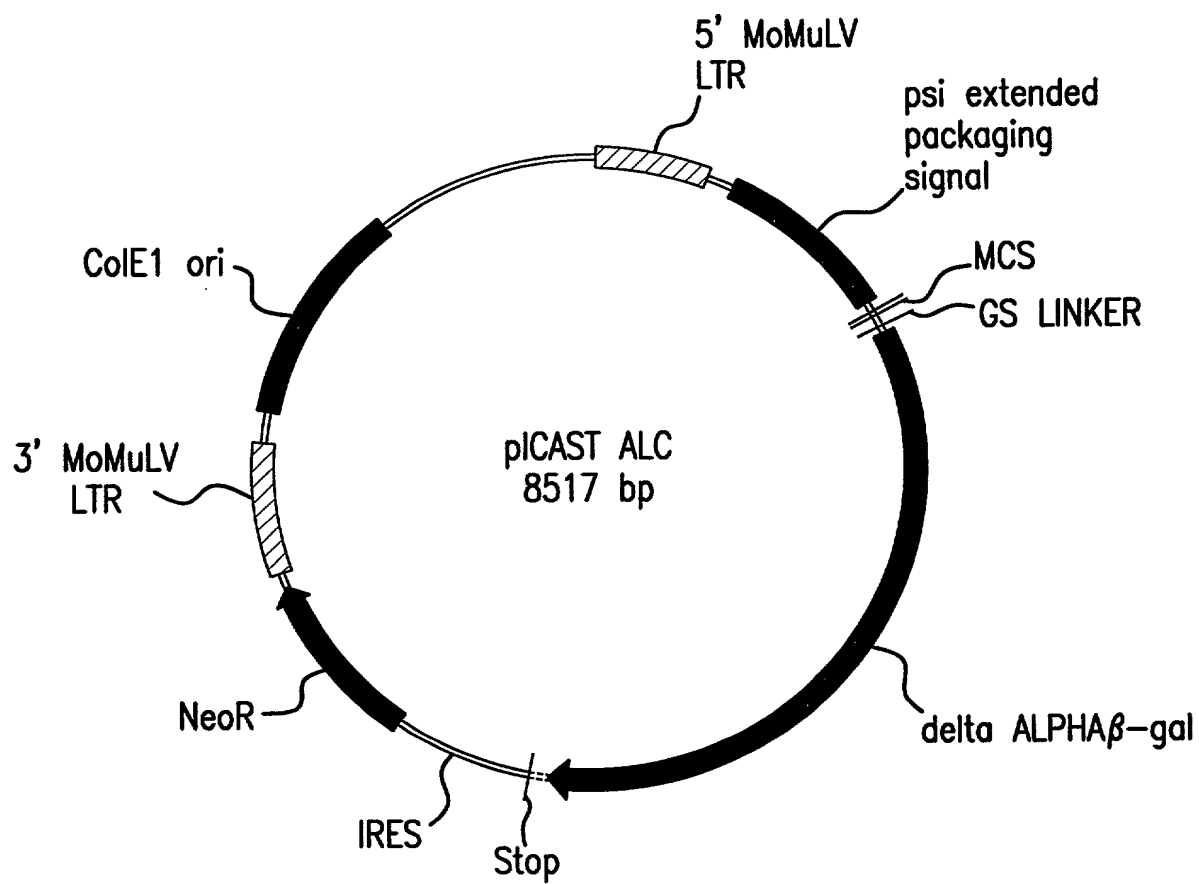


FIG.10A

pICAST ALC

1 CTGCAGCCTG AATATGGGCC AAACAGGATA TCTGTGGTAA GCAGTTCCTG
GACGTCGGAC TTATACCCGG TTTGTCCTAT AGACACCATT CGTCAAGGAC

51 CCCC GGCTCA GGGCCAAGAA CAGATGGAAC AGCTGAATAT GGGCCAAACA
GGGGCCGAGT CCCGGTTCTT GTCTACCTTG TCGACTTATA CCCGGTTTGT

101 GGATATCTGT GGTAAGCAGT TCCTGCCCCG GCTCAGGGCC AAGAACAGAT
CCTATAGACA CCATTCGTCA AGGACGGGGC CGAGTCCCGG TTCTTGTCTA

151 GGTCCCCAGA TGCGGTCCAG CCCTCAGCAG TTTCTAGAGA ACCATCAGAT
CCAGGGGTCT ACGCCAGGTC GGGAGTCGTC AAAGATCTCT TGGTAGTCTA

201 GTTTCAGGG TGCCCCAAGG ACCTGAAATG ACCCTGTGCC TTATTTGAAC
CAAAGGTCCC ACGGGGTTCC TGGACTTTAC TGGGACACGG AATAAACTTG

251 TAACCAATCA GTTCGCTTCT CGCTTCTGTT CGCGCGCTTC TGCTCCCCGA
ATTGGTTAGT CAAGCGAAGA GCGAAGACAA GCGCGCGAAG ACGAGGGGCT

301 GCTCAATAAA AGAGCCCACA ACCCCTCACT CGGGGCGCCA GTCCTCCGAT
CGAGTTATTT TCTCGGTGT TGGGGAGTGA GCCCCGCGGT CAGGAGGCTA

351 TGA CTGAGTC GCCCGGGTAC CCGTGTATCC AATAAACCT CTTGCAGTTG
ACTGACTCAG CGGGCCCATG GGCACATAGG TTATTTGGGA GAACGTCAAC

401 CATCCGACTT GTGGTCTCGC TGTTCC TTGG GAGGGTCTCC TCTGAGTGAT
GTAGGCTGAA CACCAGAGCG ACAAGGAACC CTCCCAGAGG AGACTCACTA

451 TGA CTACCCG TCAGCGGGGG TCTTTCATTT GGGGGCTCGT CCGGGATCGG
ACTGATGGGC AGTCGCCCCC AGAAAGTAAA CCCCCGAGCA GGCCCTAGCC

501 GAGACCCCTG CCCAGGGACC ACCGACCCAC CACCGGGAGG CAAGCTGGCC
CTCTGGGGAC GGGTCCCTGG TGGCTGGGTG GTGGCCCTCC GTTCGACCGG

551 AGCAACTTAT CTGTGTCTGT CCGATTGTCT AGTGTCTATG ACTGATTTTA
TCGTTGAATA GACACAGACA GGCTAACAGA TCACAGATAC TGA CTAAAAT

601 TGCGCCTGCG TCGGTACTAG TTAGCTAACT AGCTCTGTAT CTGGCGGACC
ACGCGGACGC AGCCATGATC AATCGATTGA TCGAGACATA GACCGCCTGG

FIG.10B-1

pICAST ALC

651 CGTGGTGGAA CTGACGAGTT CTGAACACCC GGCCGCAACC CTGGGAGACG
GCACCACCTT GACTGCTCAA GACTTGTGGG CCGGCGTTGG GACCCTCTGC

701 TCCCAGGGAC TTTGGGGGCC GTTTTTGTGG CCCGACCTGA GGAAGGGAGT
AGGGTCCCTG AAACCCCCGG CAAAAACACC GGGCTGGACT CCTTCCCTCA

751 CGATGTGGAA TCCGACCCCG TCAGGATATG TGGTTCTGGT AGGAGACGAG
GCTACACCTT AGGCTGGGGC AGTCCTATAC ACCAAGACCA TCCTCTGCTC

801 AACCTAAAC AGTTCCCGCC TCCGTCTGAA TTTTGTCTT CGGTTTGGAA
TTGGATTTTG TCAAGGGCGG AGGCAGACTT AAAACGAAA GCCAAACCTT

851 CCGAAGCCGC GCGTCTTGTC TGCTGCAGCA TCGTTCTGTG TTGTCTCTGT
GGCTTCGGCG CGCAGAACAG ACGACGTCGT AGCAAGACAC AACAGAGACA

901 CTGACTGTGT TTCTGTATTT GTCTGAAAAT TAGGGCCAGA CTGTTACCAC
GACTGACACA AAGACATAAA CAGACTTTTA ATCCCGGTCT GACAATGGTG

951 TCCCTTAAGT TTGACCTTAG GTAACCTGGAA AGATGTCGAG CGGCTCGCTC
AGGGAATTCA AACTGGAATC CATTGACCTT TCTACAGCTC GCCGAGCGAG

1001 ACAACCAGTC GGTAGATGTC AAGAAGAGAC GTTGGGTAC CTTCTGCTCT
TGTTGGTCAG CCATCTACAG TTCTTCTCTG CAACCCAATG GAAGACGAGA

1051 GCAGAATGGC CAACCTTTAA CGTCGGATGG CCGCGAGACG GCACCTTTAA
CGTCTTACCG GTTGGAATTT GCAGCCTACC GGCCTCTGCTG CGTGGAAATT

1101 CCGAGACCTC ATCACCAGG TTAAGATCAA GGTCTTTTCA CCTGGCCCGC
GGCTCTGGAG TAGTGGGTCC AATTCTAGTT CCAGAAAAGT GGACCGGGCG

1151 ATGGACACCC AGACCAGGTC CCCTACATCG TGACCTGGGA AGCCTTGGCT
TACCTGTGGG TCTGGTCCAG GGGATGTAGC ACTGGACCCT TCGGAACCGA

1201 TTTGACCCCC CTCCCTGGGT CAAGCCCTTT GTACACCCTA AGCCTCCGCC
AAACTGGGGG GAGGGACCCA GTTCGGGAAA CATGTGGGAT TCGGAGGCGG

1251 TCCTCTTCCT CCATCCGCCC CGTCTCTCCC CCTTGAACCT CCTCGTTCGA
AGGAGAAGGA GGTAGGCGGG GCAGAGAGGG GGAACCTGGA GGAGCAAGCT

FIG.10B-2

pICAST ALC

1301 CCCCgcctcg ATCCTCCCTT TATCCAGCCC TCACTCCTTC TCTAGGCGCC
GGGGCGGAGC TAGGAGGGAA ATAGGTCGGG AGTGAGGAAG AGATCCGCGG

1351 GGCCGCTCTA GCCCATTAAT ACGACTCACT ATAGGGCGAT TCGAATCAGG
CCGGCGAGAT CGGGTAATTA TGCTGAGTGA TATCCCGCTA AGCTTAGTCC

1401 CCTTGGCGCG CCGGATCCTT AATTAAGCGC AATTGGGAGG TGGCGGTAGC
GGAACCGCGC GGCCTAGGAA TTAATTCGCG TTAACCCTCC ACCGCCATCG

+2 M G V I T D S L A V V A R T D
]-----

1451 CTCGAGATGG GCGTGATTAC GGATTCACTG GCCGTCGTGG CCCGCACCGA
GAGCTCTACC CGCACTAATG CCTAAGTGAC CGGCAGCACC GGGCGTGGCT

+2 R P S Q Q L R S L N G E W R F A

1501 TCGCCCTTCC CAACAGTTAC GCAGCCTGAA TGGCGAATGG CGCTTTGCCT
AGCGGGAAGG GTTGTCATG CGTCGGACTT ACCGCTTACC GCGAAACGGA

+2 W F P A P E A V P E S W L E C D L

1551 GGTTTCCGGC ACCAGAAGCG GTGCCGAAA GCTGGCTGGA GTGCGATCTT
CCAAAGGCCG TGGTCTTCGC CACGGCCTTT CGACCGACCT CACGCTAGAA

+2 P E A D T V V V P S N W Q M H G Y

1601 CCTGAGGCCG ATACTGTCGT CGTCCCCTCA AACTGGCAGA TGCACGGTTA
GGACTCCGGC TATGACAGCA GCAGGGGAGT TTGACCGTCT ACGTGCCAAT

+2 D A P I Y T N V T Y P I T V N P

1651 CGATGCGCCC ATCTACACCA ACGTGACCTA TCCCATTACG GTCAATCCGC
GCTACGCGGG TAGATGTGGT TGCACTGGAT AGGGTAATGC CAGTTAGGCG

+2 P F V P T E N P T G C Y S L T F N

1701 CGTTTGTTC CACGGAGAAT CCGACGGGTT GTTACTCGCT CACATTTAAT
GCAACAAGG GTGCCTCTTA GGCTGCCCAA CAATGAGCGA GTGTAAATTA

FIG.10B-3

pICAST ALC

```

+2      V D E S W L Q E G Q T R I I F D G
-----
1751    GTTGATGAAA GCTGGCTACA GGAAGGCCAG ACGCGAATTA TTTTGTATGG
        CAACTACTTT CGACCGATGT CCTTCCGGTC TGCCTTAAT AAAAATACC

+2      V N S A F H L W C N G R W V G Y
-----
1801    CGTTAACTCG GCGTTTCATC TGTGGTGCAA CGGGCGCTGG GTCGGTTACG
        GCAATTGAGC CGCAAAGTAG ACACCACGTT GCCCGCGACC CAGCCAATGC

+2      G Q D S R L P S E F D L S A F L R
-----
1851    GCCAGGACAG TCGTTTGCCG TCTGAATTTG ACCTGAGCGC ATTTTACGC
        CGGTCCTGTC AGCAAACGGC AGACTTAAAC TGGACTCGCG TAAAAATGCG

+2      A G E N R L A V M V L R W S D G S
-----
1901    GCCGGAGAAA ACCGCCTCGC GGTGATGGTG CTGCGCTGGA GTGACGGCAG
        CGGCCTCTTT TGGCGGAGCG CCACTACCAC GACGCGACCT CACTGCCGTC

+2      Y L E D Q D M W R M S G I F R D
-----
1951    TTATCTGGAA GATCAGGATA TGTGGCGGAT GAGCGGCATT TTCCGTGACG
        AATAGACCTT CTAGTCCTAT ACACCGCCTA CTCGCCGTAA AAGGCACTGC

+2      V S L L H K P T T Q I S D F H V A
-----
2001    TCTCGTTGCT GCATAAACCG ACTACACAAA TCAGCGATTT CCATGTTGCC
        AGAGCAACGA CGTATTTGGC TGATGTGTTT AGTCGCTAAA GGTACAACGG

+2      T R F N D D F S R A V L E A E V Q
-----
2051    ACTCGCTTTA ATGATGATTT CAGCCGCGCT GTACTGGAGG CTGAAGTTCA
        TGAGCGAAAT TACTACTAAA GTCGGCGCGA CATGACCTCC GACTTCAAGT

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FIG.10B-4

pICAST ALC

+2	M C G E L R D Y L R V T V S L W

2101	GATGTGCGGC GAGTTGCGTG ACTACCTACG GGTAACAGTT TCTTTATGGC CTACACGCCG CTCAACGCAC TGATGGATGC CCATTGTCAA AGAAATACCG
+2	Q G E T Q V A S G T A P F G G E I

2151	AGGGTGAAAC GCAGGTCGCC AGCGGCACCG CGCCTTTCGG CGGTGAAATT TCCCACCTTG CGTCCAGCGG TCGCCGTGGC GCGGAAAGCC GCCACTTTAA
+2	I D E R G G Y A D R V T L R L N V

2201	ATCGATGAGC GTGGTGGTTA TGCCGATCGC GTCACACTAC GTCTGAACGT TAGCTACTCG CACCACCAAT ACGGCTAGCG CAGTGTGATG CAGACTTGCA
+2	E N P K L W S A E I P N L Y R A

2251	CGAAAACCCG AAAGTGTGGA GCGCCGAAAT CCCGAATCTC TATCGTGCGG GCTTTTGGGC TTTGACACCT CGCGGCTTTA GGGCTTAGAG ATAGCACGCC
+2	V V E L H T A D G T L I E A E A C

2301	TGGTTGAACT GCACACCGCC GACGGCACGC TGATTGAAGC AGAAGCCTGC ACCAACTTGA CGTGTGGCGG CTGCCGTGCG ACTAACTTCG TCTTCGGACG
+2	D V G F R E V R I E N G L L L L N

2351	GATGTCGGTT TCCGCGAGGT GCGGATTGAA AATGGTCTGC TGCTGCTGAA CTACAGCCAA AGGCGCTCCA CGCCTAACTT TTACCAGACG ACGACGACTT
+2	G K P L L I R G V N R H E H H P

2401	CGGCAAGCCG TTGCTGATTC GAGGCGTTAA CCGTCACGAG CATCATCCTC GCCGTTCCGGC AACGACTAAG CTCCGCAATT GGCAGTGCTC GTAGTAGGAG

FIG.10B-5

pICAST ALC

```

+2   L H G Q V M D E Q T M V Q D I L L
-----
2451 TGCATGGTCA GGTCATGGAT GAGCAGACGA TGGTGCAGGA TATCCTGCTG
    ACGTACCAGT CCAGTACCTA CTCGTCTGCT ACCACGTCCT ATAGGACGAC

+2   M K Q N N F N A V R C S H Y P N H
-----
2501 ATGAAGCAGA ACAACTTTAA CGCCGTGCGC TGTTTCGCATT ATCCGAACCA
    TACTTCGTCT TGTTGAAATT GCGGCACGCG ACAAGCGTAA TAGGCTTGGT

+2   P L W Y T L C D R Y G L Y V V D
-----
2551 TCCGCTGTGG TACACGCTGT GCGACCGCTA CGGCCTGTAT GTGGTGGATG
    AGGCGACACC ATGTGCGACA CGCTGGCGAT GCCGGACATA CACCACCTAC

+2   E A N I E T H G M V P M N R L T D
-----
2601 AAGCCAATAT TGAAACCCAC GGCATGGTGC CAATGAATCG TCTGACCGAT
    TTCGGTTATA ACTTTGGGTG CCGTACCACG GTTACTTAGC AGACTGGCTA

+2   D P R W L P A M S E R V T R M V Q
-----
2651 GATCCGCGCT GGCTACCGGC GATGAGCGAA CGCGTAACGC GAATGGTGCA
    CTAGGCGCGA CCGATGGCCG CTA CTGCTT GCGCATTGCG CTTACCACGT

+2   R D R N H P S V I I W S L G N E
-----
2701 GCGCGATCGT AATCACCCGA GTGTGATCAT CTGGTCGCTG GGAATGAAT
    CGCGCTAGCA TTAGTGGGCT CACACTAGTA GACCAGCGAC CCCTTACTTA

+2   S G H G A N H D A L Y R W I K S V
-----
2751 CAGGCCACGG CGCTAATCAC GACGCGCTGT ATCGCTGGAT CAAATCTGTC
    GTCCGGTGCC GCGATTAGTG CTGCGCGACA TAGCGACCTA GTTTAGACAG
  
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FIG.10B-6

pICAST ALC

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+2      D P S R P V Q Y E G G G A D T T A
-----
2801    GATCCTTCCC GCCCGGTGCA GTATGAAGGC GGC GGAGCCG ACACCACGGC
      CTAGGAAGGG CGGGCCACGT CATACTTCCG CCGCCTCGGC TGTGGTGCCG

+2      T D I I C P M Y A R V D E D Q P
-----
2851    CACCGATATT ATTTGCCCCG TGTACGCGCG CGTGGATGAA GACCAGCCCT
      GTGGCTATAA TAAACGGGCT ACATGCGCGC GCACCTACTT CTGGTCGGGA

+2      F P A V P K W S I K K W L S L P G
-----
2901    TCCCGGCTGT GCCGAAATGG TCCATCAAAA AATGGCTTTC GCTACCTGGA
      AGGGCCGACA CGGCTTTACC AGGTAGTTTT TTACCGAAAG CGATGGACCT

+2      E T R P L I L C E Y A H A M G N S
-----
2951    GAGACGCGCC CGCTGATCCT TTGCGAATAC GCCCACGCGA TGGGTAACAG
      CTCTGCGCGG GCGACTAGGA AACGCTTATG CGGGTGCGCT ACCCATTGTC

+2      L G G F A K Y W Q A F R Q Y P R
-----
3001    TCTTGCGGGT TTCGCTAAAT ACTGGCAGGC GTTTCGTCAG TATCCCCGTT
      AGAACCGCCA AAGCGATTTA TGACCGTCCG CAAAGCAGTC ATAGGGGCAA

+2      L Q G G F V W D W V D Q S L I K Y
-----
3051    TACAGGGCGG CTTCGTCTGG GACTGGGTGG ATCAGTCGCT GATTAAATAT
      ATGTCCCGCC GAAGCAGACC CTGACCCACC TAGTCAGCGA CTAATTTATA

+2      D E N G N P W S A Y G G D F G D T
-----
3101    GATGAAAACG GCAACCCGTG GTCGGCTTAC GGCGGTGATT TTGGCGATAC
      CTACTTTTGC CGTTGGGCAC CAGCCGAATG CCGCCACTAA AACCGCTATG

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FIG.10B-7

pICAST ALC

+2	P N D R Q F C M N G L V F A D R

3151	GCCGAACGAT CGCCAGTTCT GTATGAACGG TCTGGTCTTT GCCGACCGCA CGGCTTGCTA GCGGTCAAGA CATACTTGCC AGACCAGAAA CGGCTGGCGT
+2	T P H P A L T E A K H Q Q Q F F Q

3201	CGCCGCATCC AGCGCTGACG GAAGCAAAAC ACCAGCAGCA GTTTTTCCAG GCGGCGTAGG TCGCGACTGC CTTCGTTTG TGGTCGTCGT CAAAAAGGTC
+2	F R L S G Q T I E V T S E Y L F R

3251	TTCCGTTTAT CCGGGCAAAC CATCGAAGTG ACCAGCGAAT ACCTGTTCCG AAGGCAAATA GGCCCGTTTG GTAGCTTCAC TGGTCGCTTA TGGACAAGGC
+2	H S D N E L L H W M V A L D G K

3301	TCATAGCGAT AACGAGCTCC TGCACTGGAT GGTGGCGCTG GATGGTAAGC AGTATCGCTA TTGCTCGAGG ACGTGACCTA CCACCGCGAC CTACCATTGC
+2	P L A S G E V P L D V A P Q G K Q

3351	CGCTGGCAAG CGGTGAAGTG CCTCTGGATG TCGCTCCACA AGGTAAACAG GCGACCGTTC GCCACTTCAC GGAGACCTAC AGCGAGGTGT TCCATTTGTC
+2	L I E L P E L P Q P E S A G Q L W

3401	TTGATTGAAC TGCCTGAACT ACCGCAGCCG GAGAGCGCCG GGCAACTCTG AACTAACTTG ACGGACTTGA TGGCGTCGGC CTCTCGCGGC CCGTTGAGAC
+2	L T V R V V Q P N A T A W S E A

3451	GCTCACAGTA CGCGTAGTGC AACCGAACGC GACCGCATGG TCAGAAGCCG CGAGTGTCAT GCGCATCACG TTGGCTTGCG CTGGCGTACC AGTCTTCGGC

FIG.10B-8

pICAST ALC

```

+2      G H I S   A W Q   Q W R L   A E N   L S V
-----
3501    GGCACATCAG CGCCTGGCAG CAGTGGCGTC TGGCGGAAAA CCTCAGTGTG
      CCGTG TAGTC GCGGACCGTC GTCACCGCAG ACCGCCTTTT GGAGTCACAC

+2      T L P A   A S H   A I P   H L T T   S E M
-----
3551    ACGTCCCCG CCGCGTCCCA CGCCATCCCG CATCTGACCA CCAGCGAAAT
      TCGAGGGGC GCGCAGGGT GCGGTAGGGC GTAGACTGGT GGTCGCTTTA

+2      D F C   I E L G   N K R   W Q F   N R Q
-----
3601    GGATTTTTGC ATCGAGCTGG GTAATAAGCG TTGGCAATTT AACCGCCAGT
      CCTAAAAACG TAGCTCGACC CATTATTCGC AACCGTAAA TTGGCGGTCA

+2      S G F L   S Q M   W I G D   K K Q   L L T
-----
3651    CAGGCTTTCT TTCACAGATG TGGATTGGCG ATAAAAACA ACTGCTGACG
      GTCCGAAAGA AAGTGTCTAC ACCTAACCGC TATTTTTTGT TGACGACTGC

+2      P L R D   Q F T   R A P   L D N D   I G V
-----
3701    CCGCTGCGCG ATCAGTTCAC CCGTGACCG CTGGATAACG ACATTGGCGT
      GCGGACGCGC TAGTCAAGTG GGCACGTGGC GACCTATTGC TGTAACCGCA

+2      S E A   T R I D   P N A   W V E   R W K
-----
3751    AAGTGAAGCG ACCCGCATTG ACCCTAACGC CTGGGTCGAA CGCTGGAAGG
      TTCCTTCGC TGGGCGTAAC TGGGATTGCG GACCCAGCTT GCGACCTTCC

+2      A A G H   Y Q A   E A A L   L Q C   T A D
-----
3801    CGGCGGGCCA TTACCAGGCC GAAGCAGCGT TGTTCAGTG CACGGCAGAT
      GCCGCCCCGT AATGGTCCGG CTCGTCGCA ACAACGTCAC GTGCCGTCTA
  
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FIG.10B-9

pICAST ALC

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+2      T L A D A V L I T T A H A W Q H Q
-----
3851    ACACTTGCTG ATGCGGTGCT GATTACGACC GCTCACGCGT GGCAGCATCA
      TGTGAACGAC TACGCCACGA CTAATGCTGG CGAGTGCGCA CCGTCGTAGT

+2      G K T L F I S R K T Y R I D G S
-----
3901    GGGGAAAACC TTATTTATCA GCCGAAAAC CTACCGGATT GATGGTAGTG
      CCCCTTTTGG AATAAATAGT CGGCCTTTTG GATGGCCTAA CTACCATCAC

+2      G Q M A I T V D V E V A S D T P H
-----
3951    GTCAAATGGC GATTACGTT GATGTTGAAG TGGCGAGCGA TACACCGCAT
      CAGTTTACCG CTAATGGCAA CTACAACTTC ACCGCTCGCT ATGTGGCGTA

+2      P A R I G L N C Q L A Q V A E R V
-----
4001    CCGGCGCGGA TTGGCCTGAA CTGCCAGCTG GCGCAGGTAG CAGAGCGGGT
      GGCCGCGCCT AACC GGACTT GACGGTCGAC CGCGTCCATC GTCTCGCCCA

+2      N W L G L G P Q E N Y P D R L T
-----
4051    AAACTGGCTC GGATTAGGGC CGCAAGAAAA CTATCCCGAC CGCCTTACTG
      TTTGACCGAG CCTAATCCCG GCGTTCTTTT GATAGGGCTG GCGGAATGAC

+2      A A C F D R W D L P L S D M Y T P
-----
4101    CCGCCTGTTT TGACCGCTGG GATCTGCCAT TGTCAGACAT GTATACCCCG
      GGCGGACAAA ACTGGCGACC CTAGACGGTA ACAGTCTGTA CATATGGGGC

+2      T V F P S E N G L R C G T R E L N
-----
4151    TACGTCTTCC CGAGCGAAAA CGGTCTGCGC TGCGGGACGC GCGAATTGAA
      ATGCAGAAGG GCTCGCTTTT GCCAGACGCG ACGCCCTGCG CGCTTAACTT
  
```

FIG.10B-10

pICAST ALC

```

+2      Y G P H Q W R G D F Q F N I S R
-----
4201    TTATGGCCCA CACCAGTGGC GCGGCGACTT CCAGTTCAAC ATCAGCCGCT
      AATACCGGGT GTGGTCACCG CGCCGCTGAA GGTCAAGTTG TAGTCGGCGA

+2      Y S Q Q Q L M E T S H R H L L H A
-----
4251    ACAGTCAACA GCAACTGATG GAAACCAGCC ATCGCCATCT GCTGCACGCG
      TGTCAGTTGT CGTTGACTAC CTTTGGTCGG TAGCGGTAGA CGACGTGCGC

+2      E E G T W L N I D G F H M G I G G
-----
4301    GAAGAAGGCA CATGGCTGAA TATCGACGGT TTCCATATGG GGATTGGTGG
      CTTCTTCCGT GTACCGACTT ATAGCTGGCA AAGGTATACC CCTAACCACC

+2      D D S W S P S V S A E F Q L S A
-----
4351    CGACGACTCC TGGAGCCCGT CAGTATCGGC GGAATTCCAG CTGAGCGCCG
      GCTGCTGAGG ACCTCGGGCA GTCATAGCCG CCTTAAGGTC GACTCGCGGC

+2      G R Y H Y Q L V W C Q K R S D Y K
-----
4401    GTCGCTACCA TTACCAGTTG GTCTGGTGTC AAAAAAGATC TGA CTATAAA
      CAGCGATGGT AATGGTCAAC CAGACCACAG TTTTCTTAG ACTGATATT

+2      D E D L D H H H H H H R
----->
4451    GATGAGGACC TCGACCATCA TCATCATCAT CACCGGTAAT AATAGGTAGA
      CTACTCCTGG AGCTGGTAGT AGTAGTAGTA GTGGCCATTA TTATCCATCT

4501    TAAGTGA CTG ATTAGATGCA TTGATCCCTC GACCAATTCC GGTTATTTTC
      ATTCACTGAC TAATCTACGT AACTAGGGAG CTGGTTAAGG CCAATAAAAG

4551    CACCATATTG CCGTCTTTTG GCAATGTGAG GGCCCGGAAA CCTGGCCCTG
      GTGGTATAAC GGCAGAAAAC CGTTACACTC CCGGGCCTTT GGACCGGGAC
  
```

FIG.10B-11

pICAST ALC

4601 TCTTCTTGAC GAGCATTCCT AGGGGTCTTT CCCCTCTCGC CAAAGGAATG
AGAAGAACTG CTCGTAAGGA TCCCCAGAAA GGGGAGAGCG GTTTCCTTAC

4651 CAAGGTCTGT TGAATGTCGT GAAGGAAGCA GTTCCTCTGG AAGCTTCTTG
GTTCCAGACA ACTTACAGCA CTTCTTCGT CAAGGAGACC TTCGAAGAAC

4701 AAGACAAACA ACGTCTGTAG CGACCCTTTG CAGGCAGCGG AACCCCCAC
TTCTGTTTGT TGCAGACATC GCTGGGAAAC GTCCGTCGCC TTGGGGGGTG

4751 CTGGCGACAG GTGCCTCTGC GGCCAAAAGC CACGTGTATA AGATACACCT
GACCGCTGTC CACGGAGACG CCGGTTTTCG GTGCACATAT TCTATGTGGA

4801 GCAAAGGCGG CACAACCCCA GTGCCACGTT GTGAGTTGGA TAGTTGTGGA
CGTTTCCGCC GTGTTGGGGT CACGGTGCAA CACTCAACCT ATCAACACCT

4851 AAGAGTCAA TGGCTCTCCT CAAGCGTATT CAACAAGGGG CTGAAGGATG
TTCTCAGTTT ACCGAGAGGA GTTCGCATAA GTTGTTCCCC GACTTCCTAC

4901 CCCAGAAGGT ACCCCATTGT ATGGGATCTG ATCTGGGGCC TCGGTGCACA
GGGTCTTCCA TGGGGTAACA TACCCTAGAC TAGACCCCGG AGCCACGTGT

4951 TGCTTTACAT GTGTTTAGTC GAGGTAAAA AACGTCTAGG CCCCCGAAC
ACGAAATGTA CACAAATCAG CTCCAATTTT TTGCAGATCC GGGGGGCTTG

5001 CACGGGGACG TGGTTTTCTT TTGAAAAACA CGATGATAAT ACCATGATTG

GTGCCCCTGC ACCAAAAGGA AACTTTTTGT GCTACTATTA TGGTACTAAC

5051 AACAGATGG ATTGCACGCA GGTCTCCGG CCGCTTGGGT GGAGAGGCTA
TTGTTCTACC TAACGTGCGT CCAAGAGGCC GGCGAACCCA CCTCTCCGAT

5101 TTCGGCTATG ACTGGGCACA ACAGACAATC GGCTGCTCTG ATGCCGCCGT
AAGCCGATAC TGACCCGTGT TGTCTGTTAG CCGACGAGAC TACGGCGGCA

5151 GTTCCGGCTG TCAGCGCAGG GGCGCCCGT TCTTTTTGTC AAGACCGACC
CAAGGCCGAC AGTCGCGTCC CCGCGGGCCA AGAAAAACAG TTCTGGCTGG

FIG.10B-12

pICAST ALC

5201 TGTCCGGTGC CCTGAATGAA CTGCAGGACG AGGCAGCGCG GCTATCGTGG
ACAGGCCACG GGACTTACTT GACGTCCTGC TCCGTCGCGC CGATAGCACC

5251 CTGGCCACGA CGGGCGTTCC TTGCGCAGCT GTGCTCGACG TTGTCACTGA
GACCGGTGCT GCCCGCAAGG AACGCGTCGA CACGAGCTGC AACAGTGACT

5301 AGCGGGAAGG GACTGGCTGC TATTGGGCGA AGTGCCGGGG CAGGATCTCC
TCGCCCTTCC CTGACCGACG ATAACCCGCT TCACGGCCCC GTCCTAGAGG

5351 TGTCATCTCA CCTTGCTCCT GCCGAGAAAG TATCCATCAT GGCTGATGCA
ACAGTAGAGT GGAACGAGGA CGGCTCTTTC ATAGGTAGTA CCGACTACGT

5401 ATGCGGCGGC TGCATACGCT TGATCCGGCT ACCTGCCCAT TCGACCACCA
TACGCCGCCG ACGTATGCGA ACTAGGCCGA TGGACGGGTA AGCTGGTGGT

5451 AGCGAAACAT CGCATCGAGC GAGCACGTAC TCGGATGGAA GCCGGTCTTG
TCGCTTTGTA GCGTAGCTCG CTCGTGCATG AGCCTACCTT CGGCCAGAAC

5501 TCGATCAGGA TGATCTGGAC GAAGAGCATC AGGGGCTCGC GCCAGCCGAA
AGCTAGTCCT ACTAGACCTG CTTCTCGTAG TCCCCGAGCG CGGTCGGCTT

5551 CTGTTGCGCA GGCTCAAGGC GCGCATGCCC GACGGCGAGG ATCTCGTCGT
GACAAGCGGT CCGAGTTCCG CGCGTACGGG CTGCCGCTCC TAGAGCAGCA

5601 GACCCATGGC GATGCCTGCT TGCCGAATAT CATGGTGGAA AATGGCCGCT
CTGGGTACCG CTACGGACGA ACGGCTTATA GTACCACCTT TTACCGGCGA

5651 TTTCTGGATT CATCGACTGT GGCCGGCTGG GTGTGGCGGA CCGCTATCAG
AAAGACCTAA GTAGCTGACA CCGGCCGACC CACACCGCCT GGCGATAGTC

5701 GACATAGCGT TGGCTACCCG TGATATTGCT GAAGAGCTTG GCGGCGAATG
CTGTATCGCA ACCGATGGGC ACTATAACGA CTTCTCGAAC CGCCGCTTAC

5751 GGCTGACCGC TTCCTCGTGC TTTACGGTAT CGCCGCTCCC GATTGCGAGC
CCGACTGGCG AAGGAGCACG AAATGCCATA GCGGCGAGGG CTAAGCGTCG

FIG.10B-13

pICAST ALC

5801 GCATCGCCTT CTATCGCCTT CTTGACGAGT TCTTCTGAGC GGGACTCTGG
CGTAGCGGAA GATAGCGGAA GAACTGCTCA AGAAGACTCG CCCTGAGACC

5851 GGTTCGCATC GATAAAATAA AAGATTTTAT TTAGTCTCCA GAAAAAGGGG
CCAAGCGTAG CTATTTTATT TTCTAAAATA AATCAGAGGT CTTTTTCCCC

5901 GGAATGAAAG ACCCCACCTG TAGGTTTGGC AAGCTAGCTT AAGTAACGCC
CCTTACTTTC TGGGGTGGAC ATCCAAACCG TTCGATCGAA TTCATTGCGG

5951 ATTTTGCAAG GCATGGAAAA ATACATAACT GAGAATAGAG AAGTTCAGAT
TAAACGTTT CGTACCTTTT TATGTATTGA CTCTTATCTC TTCAAGTCTA

6001 CAAGGTCAGG AACAGATGGA ACAGCTGAAT ATGGGCCAAA CAGGATATCT
GTTCCAGTCC TTGTCTACCT TGTCGACTTA TACCCGGTTT GTCCTATAGA

6051 GTGGTAAGCA GTTCCTGCCC CGGCTCAGGG CCAAGAACAG ATGGAACAGC
CACCATTCTG CAAGGACGGG GCCGAGTCCC GGTTCCTGTC TACCTTGTCG

6101 TGAATATGGG CCAAACAGGA TATCTGTGGT AAGCAGTTCC TGCCCCGGCT
ACTTATACCC GGTTTGTCTT ATAGACACCA TTCGTCAAGG ACGGGGCCGA

6151 CAGGGCCAAG AACAGATGGT CCCCAGATGC GGTCCAGCCC TCAGCAGTTT
GTCCCGGTTT TTGTCTACCA GGGGTCTACG CCAGGTCGGG AGTCGTCAAA

6201 CTAGAGAACC ATCAGATGTT TCCAGGGTGC CCCAAGGACC TGAAATGACC
GATCTCTTGG TAGTCTACAA AGGTCCCACG GGGTTCCTGG ACTTTACTGG

6251 CTGTGCCTTA TTTGAACTAA CCAATCAGTT CGCTTCTCGC TTCTGTTTCG
GACACGGAAT AAATTGATT GGTTAGTCAA GCGAAGAGCG AAGACAAGCG

6301 GCGCTTCTGC TCCCCGAGCT CAATAAAGA GCCCACAACC CCTCACTCGG
CGCGAAGACG AGGGGCTCGA GTTATTTTCT CGGGTGTGTTGG GGAGTGAGCC

6351 GGCGCCAGTC CTCCGATTGA CTGAGTCGCC CGGGTACCCG TGTATCCAAT
CCGCGGTCAG GAGGCTAACT GACTCAGCGG GCCCATGGGC ACATAGGTTA

FIG.10B-14

pICAST ALC

6401 AAACCCTCTT GCAGTTGCAT CCGACTTGTG GTCTCGCTGT TCCTTGGGAG
TTTGGGAGAA CGTCAACGTA GGCTGAACAC CAGAGCGACA AGGAACCCTC

6451 GGTCTCCTCT GAGTGATTGA CTACCCGTCA GCGGGGGTCT TTCATTCATG
CCAGAGGAGA CTCACTAACT GATGGGCAGT CGCCCCAGA AAGTAAGTAC

6501 CAGCATGTAT CAAAATTAAT TTGGTTTTTT TTCTTAAGTA TTTACATTAA
GTCGTACATA GTTTTAATTA AACCAAAAAA AAGAATTCAT AAATGTAATT

6551 ATGGCCATAG TTGCATTAAT GAATCGGCCA ACGCGCGGGG AGAGGCGGTT
TACCGGTATC AACGTAATTA CTTAGCCGGT TCGCGGCCCC TCTCCGCCAA

6601 TGCGTATTGG CGCTCTTCCG CTTCTCGCT CACTGACTCG CTGCGCTCGG
ACGCATAACC GCGAGAAGGC GAAGGAGCGA GTGACTGAGC GACGCGAGCC

6651 TCGTTCGGCT GCGGCGAGCG GTATCAGCTC ACTCAAAGGC GGTAATACGG
AGCAAGCCGA CGCCGCTCGC CATAGTCGAG TGAGTTTCCG CCATTATGCC

FIG.10B-15

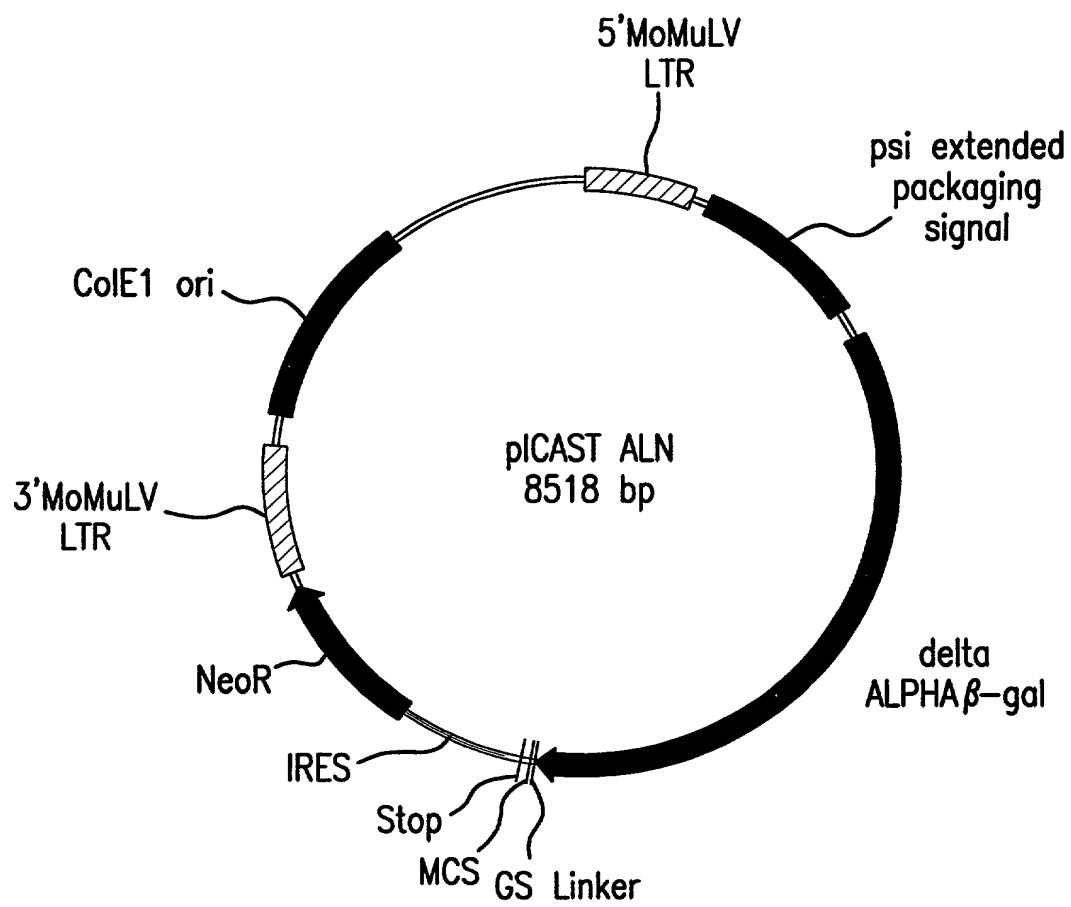


FIG.11A

pICAST ALN

CTGCAGCCTG	AATATGGGCC	AAACAGGATA	TCTGTGGTAA	GCAGTTCCTG	CCCCGGCTCA	60
GACGTCGGAC	TTATACCCGG	TTTGTCTAT	AGACACCATT	CGTCAAGGAC	GGGGCCGAGT	60
GGGCCAAGAA	CAGATGGAAC	AGCTGAATAT	GGGCCAAACA	GGATATCTGT	GGTAAGCAGT	120
CCCGGTTCTT	GTCTACCTTG	TCGACTTATA	CCCGGTTTGT	CCTATAGACA	CCATTTCGTCA	120
TCCTGCCCCG	GCTCAGGGCC	AAGAACAGAT	GGTCCCCAGA	TGCGGTCCAG	CCCTCAGCAG	180
AGGACGGGGC	CGAGTCCCGG	TTCTTGTCTA	CCAGGGGTCT	ACGCCAGGTC	GGGAGTCGTC	180
TTTCTAGAGA	ACCATCAGAT	GTTTCCAGGG	TGCCCCAAGG	ACCTGAAATG	ACCCTGTGCC	240
AAAGATCTCT	TGGTAGTCTA	CAAAGGTCCC	ACGGGGTTCC	TGGACTTTAC	TGGGACACGG	240
TTATTTGAAC	TAACCAATCA	GTTTCGTTCT	CGCTTCTGTT	CGCGCGCTTC	TGCTCCCCGA	300
AATAAACTTG	ATTGGTTAGT	CAAGCGAAGA	GCGAAGACAA	GCGCGCGAAG	ACGAGGGGCT	300
GCTCAATAAA	AGAGCCCACA	ACCCGTCACT	CGGGGCGCCA	GTCCTCCGAT	TGACTGAGTC	360
CGAGTTATTT	TCTCGGGTGT	TGGGGAGTGA	GCCCCGCGGT	CAGGAGGCTA	ACTGACTCAG	360
GCCCGGGTAC	CCGTGTATCC	AATAAACCTT	CTTGCAGTTG	CATCCGACTT	GTGGTCTCGC	420
CGGGCCCATG	GGCACATAGG	TTATTTGGGA	GAACGTCAAC	GTAGGCTGAA	CACCAGAGCG	420
TGTTCCTTGG	GAGGGTCTCC	TCTGAGTGAT	TGACTACCCG	TCAGCGGGGG	TCTTTCATTT	480
ACAAGGAACC	CTCCAGAGG	AGACTCACTA	ACTGATGGGC	AGTCGCCCCC	AGAAAGTAAA	480
GGGGGCTCGT	CCGGGATCGG	GAGACCCCTG	CCCAGGGACC	ACCGACCCAC	CACCGGGAGG	540
CCCCCGAGCA	GGCCCTAGCC	CTCTGGGGAC	GGGTCCCTGG	TGGCTGGGTG	GTGGCCCTCC	540
CAAGCTGGCC	AGCAACTTAT	CTGTGTCTGT	CCGATTGTCT	AGTGTCTATG	ACTGATTTTA	600
GTTTCGACCG	TCGTTGAATA	GACACAGACA	GGCTAACAGA	TCACAGATAC	TGACTAAAAT	600
TGCGCCTGCG	TCGGTACTAG	TTAGCTAACT	AGCTCTGTAT	CTGGCGGACC	CGTGGTGGAA	660
ACGCGGACGC	AGCCATGATC	AATCGATTGA	TCGAGACATA	GACCGCCTGG	GCACCACCTT	660
CTGACGAGTT	CTGAACACCC	GGCCGCAACC	CTGGGAGACG	TCCCAGGGAC	TTTGGGGGCC	720
GACTGCTCAA	GACTTGTGGG	CCGGCGTTGG	GACCCTCTGC	AGGGTCCCTG	AAACCCCGG	720
GTTTTTGTGG	CCCGACCTGA	GGAAGGGAGT	CGATGTGGAA	TCCGACCCCG	TCAGGATATG	780
CAAAAACACC	GGGCTGGACT	CCTTCCCTCA	GCTACACCTT	AGGCTGGGGC	AGTCCTATAC	780

FIG. 11B-1

pICAST ALN

TGGTTCTGGT	AGGAGACGAG	AACCTAAAC	AGTTCCCGCC	TCCGTCTGAA	TTTTTGCTTT	840
ACCAAGACCA	TCCTCTGCTC	TTGGATTTTG	TCAAGGGCGG	AGGCAGACTT	AAAAACGAAA	840
CGGTTTGGAA	CCGAAGCCGC	GCGTCTTGTC	TGCTGCAGCA	TCGTTCTGTG	TTGTCTCTGT	900
GCCAAACCTT	GGCTTCGGCG	CGCAGAACAG	ACGACGTCGT	AGCAAGACAC	AACAGAGACA	900
CTGACTGTGT	TTCTGTATTT	GTCTGAAAAT	TAGGGCCAGA	CTGTTACCAC	TCCCTTAAGT	960
GACTGACACA	AAGACATAAA	CAGACTTTTA	ATCCCGGTCT	GACAATGGTG	AGGGAATTCA	960
TTGACCTTAG	GTAAC TGAA	AGATGTCGAG	CGGCTCGCTC	ACAACCAGTC	GGTAGATGTC	1020
AACTGGAATC	CATTGACCTT	TCTACAGCTC	GCCGAGCGAG	TGTTGGTCAG	CCATCTACAG	1020
AAGAAGAGAC	GTTGGGTTAC	CTTCTGCTCT	GCAGAATGGC	CAACCTTTAA	CGTCGGATGG	1080
TTCTTCTCTG	CAACCCAATG	GAAGACGAGA	CGTCTTACCG	GTTGGAAATT	GCAGCCTACC	1080
CCGCGAGACG	GCACCTTTAA	CCGAGACCTC	ATCACCCAGG	TTAAGATCAA	GGTCTTTTCA	1140
GGCGCTCTGC	CGTGGAAATT	GGCTCTGGAG	TAGTGGGTCC	AATTCTAGTT	CCAGAAAAGT	1140
CCTGGCCCGC	ATGGACACCC	AGACCAGGTC	CCCTACATCG	TGACCTGGGA	AGCCTTGGCT	1200
GGACCGGGCG	TACCTGTGGG	TCTGGTCCAG	GGGATGTAGC	ACTGGACCCT	TCGGAACCGA	1200
TTTGACCCCC	CTCCCTGGGT	CAAGCCCTTT	GTACACCCTA	AGCCTCCGCC	TCCTCTTCCT	1260
AAACTGGGGG	GAGGGACCCA	GTTCGGGAAA	CATGTGGGAT	TCGGAGGCGG	AGGAGAAGGA	1260
CCATCCGCCC	CGTCTCTCCC	CCTTGAACCT	CCTCGTTCGA	CCCCGCCTCG	ATCCTCCCTT	1320
GGTAGGCGGG	GCAGAGAGGG	GGAAC TTGGA	GGAGCAAGCT	GGGGCGGAGC	TAGGAGGGAA	1320
TATCCAGCCC	TACTCCTTC	TCTAGGCGCC	GGCCGCTCTA	GCCCATTAAT	ACGACTCACT	1380
ATAGGTCGGG	AGTGAGGAAG	AGATCCGCGG	CCGGCGAGAT	CGGGTAATTA	TGCTGAGTGA	1380
ATAGGGCGAT	TCGAACACCA	TGCACCATCA	TCATCATCAC	GTCGACTATA	AAGATGAGGA	1440
TATCCCGCTA	AGCTTG TGGT	ACGTGGTAGT	AGTAGTAGTG	CAGCTGATAT	TTCTACTCCT	1440
CCTCGAGATG	GGCGTGATTA	CGGATTCACT	GGCCGTCTGT	GCCCCACCG	ATCGCCCTTC	1500
GGAGCTCTAC	CCGCACTAAT	GCCTAAGTGA	CCGGCAGCAC	CGGGCGTGGC	TAGCGGGAAG	1500
CCAACAGTTA	CGCAGCCTGA	ATGGCGAATG	GCGCTTTGCC	TGGTTTCCGG	CACCAGAAGC	1560
GGTTGTCAAT	GCGTCGGA CT	TACCGCTTAC	CGCGAAACGG	ACCAAAGGCC	GTGGTCTTCG	1560

FIG.11B-2

pICAST ALN

GGTGCCGGAA	AGCTGGCTGG	AGTGCGATCT	TCCTGAGGCC	GATACTGTCG	TCGTCCCCTC	1620
CCACGGCCTT	TCGACCGACC	TCACGCTAGA	AGGACTCCGG	CTATGACAGC	AGCAGGGGAG	1620
AAACTGGCAG	ATGCACGGTT	ACGATGCGCC	CATCTACACC	AACGTGACCT	ATCCCATTAC	1680
TTTGACCGTC	TACGTGCCAA	TGCTACGCGG	GTAGATGTGG	TTGCACTGGA	TAGGGTAATG	1680
GGTCAATCCG	CCGTTTGTTT	CCACGGAGAA	TCCGACGGGT	TGTTACTCGC	TCACATTTAA	1740
CCAGTTAGGC	GGCAAACAAG	GGTGCCTCTT	AGGCTGCCCA	ACAATGAGCG	AGTGTAATTT	1740
TGTTGATGAA	AGCTGGCTAC	AGGAAGGCCA	GACGCGAATT	ATTTTTGATG	GCGTTAACTC	1800
ACAATACTTT	TCGACCGATG	TCCTTCCGGT	CTGCGCTTAA	TAAAACTAC	CGCAATTGAG	1800
GGCGTTTCAT	CTGTGGTGCA	ACGGGCGCTG	GGTCGGTTAC	GGCCAGGACA	GTCGTTTGCC	1860
CCGCAAAGTA	GACACCACGT	TGCCCAGCAC	CCAGCCAATG	CCGGTCCTGT	CAGCAAACGG	1860
GTCTGAATTT	GACCTGAGCG	CATTTTTACG	CGCCGGAGAA	AACCGCCTCG	CGGTGATGGT	1920
CAGACTTAAA	CTGGACTCGC	GTAAAAATGC	GCGGCCTCTT	TTGGCGGAGC	GCCACTACCA	1920
GCTGGGCTGG	AGTGACGGCA	GTTATCTGGA	AGATCAGGAT	ATGTGGCGGA	TGAGCGGCAT	1980
CGACGCGACC	TCCTGCCGT	CAATAGACCT	TCTAGTCCTA	TACACCGCCT	ACTCGCCGTA	1980
TTTCCGTGAC	GTCTCGTTGC	TGCATAAACC	GACTACACAA	ATCAGCGATT	TCCATGTTGC	2040
AAAGGCACTG	CAGAGCAACG	ACGTATTTGG	CTGATGTGTT	TAGTCGCTAA	AGGTACAACG	2040
CACTCGCTTT	AATGATGATT	RCAGCCGCGC	TGTAAGGAG	GCTGAAGTTC	AGATGTGCGG	2100
GTGAGCGAAA	TTACTACTAA	AGTCGGCGCG	ACATGACCTC	CGACTTCAAG	TCTACACGCC	2100
CGAGTTGCGT	GACTACCTAC	GGGTAACAGT	TTCTTTATGG	CAGGGTGAAA	CGCAGGTCGC	2160
GCTCAACGCA	CTGATGGATG	CCCATTGTCA	AAGAAATACC	GTCCCACTTT	GCGTCCAGCG	2160
CAGCGGCACC	GCGCCTTTTC	GCGGTGAAAT	TATCGATGAG	CGTGGTGGTT	ATGCCGATCG	2220
GTCGCCGTGG	CGCGGAAAGC	CGCCACTTTA	ATAGCTACTC	GCACCACCAA	TACGGCTAGC	2220
CGTCACACTA	CGTCTGAACG	TCGAAAACCC	GAAACTGTGG	AGCGCCGAAA	TCCCGAATCT	2280
GCAGTGTGAT	GCAGACTTGC	AGCTTTTGGG	CTTTGACACC	TCGCGGCTTT	AGGGCTTAGA	2280
CTATCGTGCG	GTGGTTGAAC	TGCACACCGC	CGACGGCACG	CTGATTGAAG	CAGAAGCCTG	2340
GATAGCACGC	CACCAACTTG	ACGTGTGGCG	GCTGCCGTGC	GACTAACTTC	GTCTTCGGAC	2340

FIG. 11B-3

pICAST ALN

CGATGTCGGT	TTCCGCGAGG	TGCGGATTGA	AAATGGTCTG	CTGCTGCTGA	ACGGCAAGCC	2400
GCTACAGCCA	AAGGCGCTCC	ACGCCTAACT	TTTACCAGAC	GACGACGACT	TGCCGTTTCGG	2400
GTTGCTGATT	CGAGGCGTTA	ACCGTCACGA	GCATCATCCT	CTGCATGGTC	AGGTCATGGA	2460
CAACGACTAA	GCTCCGCAAT	TGGCAGTGCT	CGTAGTAGGA	GACGTACCAG	TCCAGTACCT	2460
TGAGCAGACG	ATGGTGCAGG	ATATCCTGCT	GATGAAGCAG	AACAACCTTA	ACGCCGTGCG	2520
ACTCGTCTGC	TACCACGTCC	TATAGGACGA	CTACTTCGTC	TTGTTGAAAT	TGCGGCACGC	2520
CTGTTTCGCAT	TATCCGAACC	ATCCGCTGTG	GTACACGCTG	TGCGACCGCT	ACGGCCTGTA	2580
GACAAGCGTA	ATAGGCTTGG	TAGGCGACAC	CATGTGCGAC	ACGCTGGCGA	TGCCGGACAT	2580
TGTGGTGGAT	GAAGCCAATA	TTGAAACCCA	CGGCATGGTG	CCAATGAATC	GTCTGACCGA	2640
ACACCACCTA	CTTCGGTTAT	AACTTTGGGT	GCCGTACCAC	GGTTACTTAG	CAGACTGGCT	2640
TGATCCGCGC	TGGCTACCGG	CGATGAGCGA	ACGCGTAACG	CGAATGGTGC	AGCGCGATCG	2700
ACTAGGCGCG	ACCGATGGCC	GCTACTCGCT	TGCGCATTGC	GCTTACCACG	TCGCGCTAGC	2700
TAATCACCCG	AGTGTGATCA	TCTGGTCGCT	GGGGAATGAA	TCAGGCCACG	GCGCTAATCA	2760
ATTAGTGGGC	TCACACTAGT	AGACCAGCGA	CCCCTTACTT	AGTCCGGTGC	CGCGATTAGT	2760
CGACGCGCTG	TATCGCTGGA	TCAAATCTGT	CGATCCTTCC	CGCCCGGTGC	AGTATGAAGG	2820
GCTGCGCGAC	ATAGCGACCT	AGTTTAGACA	GCTAGGAAGG	GCGGGCCACG	TCATACTTCC	2820
CGGCGGAGCC	GACACCACGG	CCACCGATAT	TATTTGCCCG	ATGTACGCGC	GCGTGGATGA	2880
GCCGCCTCGG	CTGTGGTGCC	GGTGGCTATA	ATAAACGGGC	TACATGCGCG	CGCACCTACT	2880
AGACCAGCCC	TTCCCGGCTG	TGCCGAAATG	GTCCATCAAA	AAATGGCTTT	CGCTACCTGG	2940
TCTGGTCGGG	AAGGGCCGAC	ACGGCTTTAC	CAGGTAGTTT	TTTACCGAAA	GCGATGGACC	2940
AGAGACGCGC	CCGCTGATCC	TTTGCGAATA	CGCCCACGCG	ATGGGTAAACA	GTCTTGGCGG	3000
TCTCTGCGCG	GGCGACTAGG	AAACGCTTAT	GCGGGTGCGC	TACCCATTGT	CAGAACCGCC	3000
TTTCGCTAAA	TACTGGCAGG	CGTTTCGTCA	GTATCCCCGT	TTACAGGGCG	GCTTCGTCTG	3060
AAAGCGATTT	ATGACCGTCC	GCAAAGCAGT	CATAGGGGCA	AATGTCCCGC	CGAAGCAGAC	3060
GGA CTGGGTG	GATCAGTCGC	TGATTAAATA	TGATGAAAAC	GGCAACCCGT	GGTCGGCTTA	3120
CCTGACCCAC	CTAGTCAGCG	ACTAATTTAT	ACTACTTTTG	CCGTTGGGCA	CCAGCCGAAT	3120

FIG. 11B-4

pICAST ALN

CGGCGGTGAT	TTTGGCGATA	CGCCGAACGA	TCGCCAGTTC	TGTATGAACG	GTCTGGTCTT	3180
GCCGCCACTA	AAACCGCTAT	GCGGCTTGCT	AGCGGTCAAG	ACATACTTGC	CAGACCAGAA	3180
TGCCGACCGC	ACGCCGCATC	CAGCGCTGAC	GGAAGCAAAA	CACCAGCAGC	AGTTTTTCCA	3240
ACGGCTGGCG	TGCGGCGTAG	GTCGCGACTG	CCTTCGTTTT	GTGGTCGTCG	TCAAAAAGGT	3240
GTTCCGTTTA	TCCGGGCAAA	CCATCGAAGT	GACCAGCGAA	TACCTGTTCC	GTCATAGCGA	3300
CAAGGCAAAT	AGGCCCGTTT	GGTAGCTTCA	CTGGTCGCTT	ATGGACAAGG	CAGTATCGCT	3300
TAACGAGCTC	CTGCACTGGA	TGGTGGCGCT	GGATGGTAAG	CCGCTGGCAA	GCGGTGAAGT	3360
ATTGCTCGAG	GACGTGACCT	ACCACCGCGA	CCTACCATTG	GGCGACCGTT	CGCCACTTCA	3360
GCCTCTGGAT	GTCGCTCCAC	AAGGTAAACA	GTTGATTGAA	CTGCCTGAAC	TACCGCAGCC	3420
CGGAGACCTA	CAGCGAGGTG	TTCCATTGTG	CAACTAACTT	GACGGACTTG	ATGGCGTCGG	3420
GGAGAGCGCC	GGGCAACTCT	GGCTCACAGT	ACGCGTAGTG	CAACCGAACG	CGACCGCATG	3480
CCTCTCGCGG	CCCGTTGAGA	CCGAGTGTCA	TGCGCATCAC	GTTGGCTTGC	GCTGGCGTAC	3480
GTCAGAAGCC	GGGCACATCA	GCGCCTGGCA	GCAGTGGCGT	CTGGCGGAAA	ACCTCAGTGT	3540
CAGTCTTCGG	CCCGTG TAGT	CGCGGACCGT	CGTCACCGCA	GACCGCCTTT	TGGAGTCACA	3540
GACGCTCCCC	GCCGCGTCCC	ACGCCATCCC	GCATCTGACC	ACCAGCGAAA	TGGATTTTTG	3600
CTGCGAGGGG	CGGCGCAGGG	TGCGGTAGGG	CGTAGACTGG	TGGTCGCTTT	ACCTAAAAAC	3600
CATCGAGCTG	GGTAATAAGC	GTTGGCAATT	TAACCGCCAG	TCAGGCTTTC	TTTCACAGAT	3660
GTAGCTCGAC	CCATTATTG	CAACCGTTAA	ATTGGCGGTC	AGTCCGAAAG	AAAGTGTCTA	3660
GTGGATTGGC	GATAAAAAAC	AACTGCTGAC	GCCGCTGCGC	GATCAGTTCA	CCCGTGCACC	3720
CACCTAACCG	CTATTTTTTG	TTGACGACTG	CGGCGACGCG	CTAGTCAAGT	GGGCACGTGG	3720
GCTGGATAAC	GACATTGGCG	TAAGTGAAGC	GACCCGCATT	GACCCTAACG	CCTGGGTCGA	3780
CGACCTATTG	CTGTAACCGC	ATTCACCTCG	CTGGGCGTAA	CTGGGATTGC	GGACCCAGCT	3780
ACGCTGGAAG	GCGGCGGGCC	ATTACCAGGC	CGAAGCAGCG	TTGTTGCAGT	GCACGGCAGA	3840
TGCGACCTTC	CGCCGCCCGG	TAATGGTCCG	GCTTCGTCGC	AACAACGTCA	CGTGCCGTCT	3840
TACACTTGCT	GATGCGGTGC	TGATTACGAC	CGCTCACGCG	TGGCAGCATC	AGGGGAAAAC	3900
ATGTGAACGA	CTACGCCACG	ACTAATGCTG	GCGAGTGC GC	ACCGTCGTAG	TCCCCTTTTG	3900

FIG. 11B-5

pICAST ALN

CTTATTTATC	AGCCGGAAAA	CCTACCGGAT	TGATGGTAGT	GGTCAAATGG	CGATTACCGT	3960
GAATAAATAG	TCGGCCTTTT	GGATGGCCTA	ACTACCATCA	CCAGTTTACC	GCTAATGGCA	3960
TGATGTTGAA	GTGGCGAGCG	ATACACCGCA	TCCGGCGCGG	ATTGGCCTGA	ACTGCCAGCT	4020
ACTACAACCT	CACCGCTCGC	TATGTGGCGT	AGGCCGCGCC	TAACCGGACT	TGACGGTCGA	4020
GGCGCAGGTA	GCAGAGCGGG	TAAACTGGCT	CGGATTAGGG	CCGCAAGAAA	ACTATCCCGA	4080
CCGCGTCCAT	CGTCTCGCCC	ATTTGACCGA	GCCTAATCCC	GGCGTTCTTT	TGATAGGGCT	4080
CCGCCTTACT	GCCGCCTGTT	TTGACCGCTG	GGATCTGCCA	TTGTCAGACA	TGTATACCCC	4140
GGCGGAATGA	CGGCGGACAA	AACTGGCGAC	CCTAGACGGT	AACAGTCTGT	ACATATGGGG	4140
GTACGTCTTC	CCGAGCGAAA	ACGGTCTGCG	CTGCGGGACG	CGCGAATTGA	ATTATGGCCC	4200
CATGCAGAAG	GGCTCGCTTT	TGCCAGACGC	GACGCCCTGC	GCGCTTAACT	TAATACCGGG	4200
ACACCAGTGG	CGCGGCGACT	TCCAGTTCAA	CATCAGCCGC	TACAGTCAAC	AGCAACTGAT	4260
TGTGGTCACC	GCGCCGCTGA	AGGTCAAGTT	GTAGTCGGCG	ATGTCAGTTG	TCGTTGACTA	4260
GGAAACCAGC	CATCGCCATC	TGCTGCACGC	GGAAGAAGGC	ACATGGCTGA	ATATCGACGG	4320
CCTTTGGTCG	GTAGCGGTAG	ACGACGTGCG	CCTTCTTCCG	TGTACCGACT	TATAGCTGCC	4320
TTTCCATATG	GGGATTGGTG	GCGACGACTC	CTGGAGCCCG	TCAGTATCGG	CGGAATTCCA	4380
AAAGGTATAC	CCCTAACCAC	CGCTGCTGAG	GACCTCGGGC	AGTCATAGCC	GCCTTAAGGT	4380
GCTGAGCGCC	GGTCGCTACC	ATTACCAGTT	GGTCTGGTGT	CAAAAAAGAT	CTGGAGGTGG	4440
CGACTCGCGG	CCAGCGATGG	TAATGGTCAA	CCAGACCACA	GTTTTTTCTA	GACCTCCACC	4440
TGGCAGCAGG	CCTTGGCGCG	CCGGATCCTT	AATTAACAAT	TGACCGGTAA	TAATAGGTAG	4500
ACCGTCGTCC	GGAACCGCGC	GGCCTAGGAA	TTAATTGTTA	ACTGGCCATT	ATTATCCATC	4500
ATAAGTGA	GATTAGATGC	ATTGATCCCT	CGACCAATTC	CGGTTATTTT	CCACCATATT	4560
TATTCATGA	CTAATCTACG	TAAGTAGGGA	GCTGGTTAAG	GCCAATAAAA	GGTGGTATAA	4560
GCCGTCTTTT	GGCAATGTGA	GGGCCCGGAA	ACCTGGCCCT	GTCTTCTTGA	CGAGCATTC	4620
CGGCAGAAAA	CCGTTACACT	CCCGGGCCTT	TGGACCGGGA	CAGAAGAACT	GCTCGTAAGG	4620
TAGGGGTCTT	TCCCCTCTCG	CCAAAGGAAT	GCAAGGTCTG	TTGAATGTCG	TGAAGGAAGC	4680
ATCCCCAGAA	AGGGGAGAGC	GGTTTCCTTA	CGTTCCAGAC	AACTTACAGC	ACTTCCTTCG	4680

FIG. 11B-6

pICAST ALN

AGTTCCTCTG	GAAGCTTCTT	GAAGACAAAC	AACGTCTGTA	GCGACCCCTTT	GCAGGCAGCG	4740
TCAAGGAGAC	CTTCGAAGAA	CTTCTGTTTG	TTGCAGACAT	CGCTGGGAAA	CGTCCGTCGC	4740
GAACCCCCCA	CCTGGCGACA	GGTGCCTCTG	CGGCCAAAAG	CCACGTGTAT	AAGATACACC	4800
CTTGGGGGGT	GGACCGCTGT	CCACGGAGAC	GCCGGTTTTT	GGTGCACATA	TTCTATGTGG	4800
TGCAAAGGCG	GCACAACCCC	AGTGCCACGT	TGTGAGTTGG	ATAGTTGTGG	AAAGAGTCAA	4860
ACGTTTCCGC	CGTGTGGGGG	TCACGGTGCA	ACACTCAACC	TATCAACACC	TTTCTCAGTT	4860
ATGGCTCTCC	TCAAGCGTAT	TCAACAAGGG	GCTGAAGGAT	GCCCAGAAGG	TACCCCATTTG	4920
TACCGAGAGG	AGTTCGCATA	AGTTGTTCCC	CGACTTCCTA	CGGGTCTTCC	ATGGGGTAAC	4920
TATGGGATCT	GATCTGGGGC	CTCGGTGCAC	ATGCTTTACA	TGTGTTTAGT	CGAGGTTAAA	4980
ATACCCTAGA	CTAGACCCCG	GAGCCACGTG	TACGAAATGT	ACACAAATCA	GCTCCAATTT	4980
AAACGTCTAG	GCCCCCGAA	CCACGGGGAC	GTGGTTTTCC	TTTGAAAAAC	ACGATGATAA	5040
TTTGCAGATC	CGGGGGGCTT	GGTGCCCCTG	CACCAAAGG	AAACTTTTTG	TGCTACTATT	5040
TACCATGATT	GAACAAGATG	GATTGCACGC	AGGTTCTCCG	GCCGCTTGGG	TGGAGAGGCT	5100
ATGGTACTAA	CTTGTTCTAC	CTAACGTGCG	TCCAAGAGGC	CGGCGAACCC	ACCTCTCCGA	5100
ATTCGGCTAT	GACTGGGCAC	AACAGACAAT	CGGCTGCTCT	GATGCCGCCG	TGTTCCGGCT	5160
TAAGCCGATA	CTGACCCGTG	TTGTCTGTTA	GCCGACGAGA	CTACGGCGGC	ACAAGGCCGA	5160
GTCAGCGCAG	GGGCGCCCGG	TTCTTTTTGT	CAAGACCGAC	CTGTCCGGTG	CCCTGAATGA	5220
CAGTCGCGTC	CCCGCGGGCC	AAGAAAAACA	GTTCTGGCTG	GACAGGCCAC	GGGACTTACT	5220
ACTGCAGGAC	GAGGCAGCGC	GGCTATCGTG	GCTGGCCACG	ACGGGCGTTC	CTTGCGCAGC	5280
TGACGTCCTG	CTCCGTCGCG	CCGATAGCAC	CGACCGGTGC	TGCCCAGCAAG	GAACGCGTCG	5280
TGTGCTCGAC	GTTGTCACTG	AAGCGGGAAG	GGACTGGCTG	CTATTGGGCG	AAGTGCCGGG	5340
ACACGAGCTG	CAACAGTGAC	TTCGCCCTTC	CCTGACCGAC	GATAACCCGC	TTCACGGCCC	5340
GCAGGATCTC	CTGTCATCTC	ACCTTGCTCC	TGCCGAGAAA	GTATCCATCA	TGGCTGATGC	5400
CGTCCTAGAG	GACAGTAGAG	TGGAACGAGG	ACGGCTCTTT	CATAGGTAGT	ACCGACTACG	5400
AATGCGGCGG	CTGCATACGC	TTGATCCGGC	TACCTGCCCA	TTGACCACC	AAGCGAAACA	5460
TTACGCCGCC	GACGTATGCG	AACTAGGCCG	ATGGACGGGT	AAGCTGGTGG	TTGCTTTTGT	5460

FIG. 11B-7

pICAST ALN

TCGCATCGAG	CGAGCACGTA	CTCGGATGGA	AGCCGGTCTT	GTCGATCAGG	ATGATCTGGA	5520
AGCGTAGCTC	GCTCGTGCAT	GAGCCTACCT	TCGGCCAGAA	CAGCTAGTCC	TACTAGACCT	5520
CGAAGAGCAT	CAGGGGCTCG	CGCCAGCCGA	ACTGTTCGCC	AGGCTCAAGG	CGCGCATGCC	5580
GCTTCTCGTA	GTCCCCGAGC	GCGGTCGGCT	TGACAAGCGG	TCCGAGTTCC	GCGCGTACGG	5580
CGACGGCGAG	GATCTCGTCG	TGACCCATGG	CGATGCCTGC	TTGCCGAATA	TCATGGTGGA	5640
GCTGCCGCTC	CTAGAGCAGC	ACTGGGTACC	GCTACGGACG	AACGGCTTAT	AGTACCACCT	5640
AAATGGCCGC	TTTTCTGGAT	TCATCGACTG	TGGCCGGCTG	GGTGTGGCGG	ACCGCTATCA	5700
TTTACCGGCG	AAAAGACCTA	AGTAGCTGAC	ACCGGCCGAC	CCACACCGCC	TGGCGATAGT	5700
GGACATAGCG	TTGGCTACCC	GTGATATTGC	TGAAGAGCTT	GGCGGCGAAT	GGGCTGACCG	5760
CCTGTATCGC	AACCGATGGG	CACTATAACG	ACTTCTCGAA	CCGCCGCTTA	CCCGACTGGC	5760
CTTCCTCGTG	CTTTACGGTA	TCGCCGCTCC	CGATTTCGCAG	CGCATCGCCT	TCTATCGCCT	5820
GAAGGAGCAC	GAAATGCCAT	AGCGGCGAGG	GCTAAGCGTC	GCGTAGCGGA	AGATAGCGGA	5820
TCTTGACGAG	TTCTTCTGAG	CGGGACTCTG	GGGTTCGCAT	CGATAAAATA	AAAGATTTTA	5880
AGAACTGCTC	AAGAAGACTC	GCCCTGAGAC	CCCAAGCGTA	GCTATTTTAT	TTTCTAAAAT	5880
TTTAGTCTCC	AGAAAAAGGG	GGGAATGAAA	GACCCACCT	GTAGGTTTGG	CAAGCTAGCT	5940
AAATCAGAGG	TCTTTTTTCC	CCCTTACTTT	CTGGGGTGGA	CATCCAAACC	GTTTCGATCGA	5940
TAAGTAACGC	CATTTTGCAA	GGCATGGAAA	AATACATAAC	TGAGAATAGA	GAAGTTCAGA	6000
ATTCATTGCG	GTAAAACGTT	CCGTACCTTT	TTATGTATTG	ACTCTTATCT	CTTCAAGTCT	6000
TCAAGGTCAG	GAACAGATGG	AACAGCTGAA	TATGGGCCAA	ACAGGATATC	TGTGGTAAGC	6060
AGTTCCAGTC	CTTGTCTACC	TTGTGCACTT	ATACCCGTTT	TGTCCTATAG	ACACCATTCTG	6060
AGTTCCTGCC	CCGGCTCAGG	GCCAAGAACA	GATGGAACAG	CTGAATATGG	GCCAAACAGG	6120
TCAAGGACGG	GGCCGAGTCC	CGGTTCTTGT	CTACCTTGTC	GACTTATACC	CGGTTTGTCC	6120
ATATCTGTGG	TAAGCAGTTC	CTGCCCCGGC	TCAGGGCCAA	GAACAGATGG	TCCCCAGATG	6180
TATAGACACC	ATTCGTCAAG	GACGGGGCCG	AGTCCCGGTT	CTTGTCTACC	AGGGGTCTAC	6180
CGGTCCAGCC	CTCAGCAGTT	TCTAGAGAAC	CATCAGATGT	TTCCAGGGTG	CCCCAAGGAC	6240
GCCAGGTCGG	GAGTCGTCAA	AGATCTCTTG	GTAGTCTACA	AAGGTCCCAC	GGGGTTCCTG	6240

FIG.11B-8

pICAST ALN

CTGAAATGAC	CCTGTGCCTT	ATTTGAACTA	ACCAATCAGT	TCGCTTCTCG	CTTCTGTTCG	6300
GACTTTACTG	GGACACGGAA	TAAACTTGAT	TGGTTAGTCA	AGCGAAGAGC	GAAGACAAGC	6300
CGCGCTTCTG	CTCCCCGAGC	TCAATAAAAAG	AGCCCACAAC	CCCTCACTCG	GGGCGCCAGT	6360
GCGCGAAGAC	GAGGGGCTCG	AGTTATTTTC	TCGGGTGTTG	GGGAGTGAGC	CCCGCGGTCA	6360
CCTCCGATTG	ACTGAGTCGC	CCGGGTACCC	GTGTATCCAA	TAAACCCTCT	TGCAGTTGCA	6420
GGAGGCTAAC	TGACTCAGCG	GGCCCATGGG	CACATAGGTT	ATTTGGGAGA	ACGTCAACGT	6420
TCCGACTTGT	GGTCTCGCTG	TTCCTTGGGA	GGGTCTCCTC	TGAGTGATTG	ACTACCCGTC	6480
AGGCTGAACA	CCAGAGCGAC	AAGGAACCCT	CCCAGAGGAG	ACTCACTAAC	TGATGGGCAG	6480
AGCGGGGGTC	TTTCATTCAT	GCAGCATGTA	TCAAATTAAT	TTTGGTTTTT	TTTCTTAAGT	6540
TCGCCCCCAG	AAAGTAAGTA	CGTCGTACAT	AGTTTTAATT	AAACCAAAAA	AAAGAATTCA	6540
ATTTACATTA	AATGGCCATA	GTTGCATTAA	TGAATCGGCC	AACGCGCGGG	GAGAGGCGGT	6600
TAAATGTAAT	TTACCGGTAT	CAACGTAATT	ACTTAGCCGG	TTGCGCGCCC	CTCTCCGCCA	6600
AACGCATAAC	CGCGAGAAGG	CGAAGGAGCG	AGTGACTGAG	CGACGCGAGC	CAGCAAGCCG	6660
TTGCGTATTG	GCGCTCTTCC	GCTTCCTCGC	TCACTGACTC	GCTGCGCTCG	GTCGTTCGGC	6660
TGCGGCGAGC	GGTATCAGCT	CACTCAAAGG	CGGTAATACG	GTTATCCACA	GAATCAGGGG	6720
ACGCCGCTCG	CCATAGTCGA	GTGAGTTTCC	GCCATTATGC	CAATAGGTGT	CTTAGTCCCC	6720
ATAACGCAGG	AAAGAACATG	TGAGCAAAAAG	GCCAGCAAAA	GGCCAGGAAC	CGTAAAAAGG	6780
TATTGCGTCC	TTTCTTGTAC	ACTCGTTTTT	CGGTCGTTTT	CCGGTCCTTG	GCATTTTTTC	6780
CCGCGTTGCT	GGCGTTTTTC	CATAGGCTCC	GCCCCCTGA	CGAGCATCAC	AAAAATCGAC	6840
GGCGCAACGA	CCGCAAAAAG	GTATCCGAGG	CGGGGGGACT	GCTCGTAGTG	TTTTTAGCTG	6840
GCTCAAGTCA	GAGGTGGCGA	AACCCGACAG	GA CTATAAAG	ATACCAGGCG	TTTCCCCCTG	6900
CGAGTTCAGT	CTCCACCGCT	TTGGGCTGTC	CTGATATTTT	TATGGTCCGC	AAAGGGGGAC	6900
GAAGCTCCCT	CGTGCGCTCT	CCTGTTCCGA	CCCTGCCGCT	TACCGGATAC	CTGTCCGCCT	6960
CTTCGAGGGA	GCACGCGAGA	GGACAAGGCT	GGGACGGCGA	ATGGCCTATG	GACAGGCGGA	6960
TTCTCCCTTC	GGGAAGCGTG	GCGCTTTCTC	ATAGCTCACG	CTGTAGGTAT	CTCAGTTCGG	7020
AAGAGGGAAG	CCCTTCGCAC	CGCGAAAGAG	TATCGAGTGC	GACATCCATA	GAGTCAAGCC	7020

FIG.11B-9

pICAST ALN

TGTAGGTCGT	TCGCTCCAAG	CTGGGCTGTG	TGCACGAACC	CCCCGTTTCTAG	CCCGACCGCT	7080
ACATCCAGCA	AGCGAGGTTT	GACCCGACAC	ACGTGCTTGG	GGGGCAAGTC	GGGCTGGCGA	7080
GCGCCTTATC	CGGTAACAT	CGTCTTGAGT	CCAACCCGGT	AAGACACGAC	TTATCGCCAC	7140
GCGGGAATAG	GCCATTGATA	GCAGAACTCA	GGTTGGGCCA	TTCTGTGCTG	AATAGCGGTG	7140
TGGCAGCAGC	CACTGGTAAC	AGGATTAGCA	GAGCGAGGTA	TGTAGGCGGT	GCTACAGAGT	7200
ACCGTCGTCG	GTGACCATTG	TCCTAATCGT	CTCGCTCCAT	ACATCCGCCA	CGATGTCTCA	7200
TCTTGAAGTG	GTGGCCTAAC	TACGGCTACA	CTAGAAGAAC	AGTATTTGGT	ATCTGCGCTC	7260
AGAACTTCAC	CACCGGATTG	ATGCCGATGT	GATCTTCTTG	TCATAAACCA	TAGACGCGAG	7260
TGCTGAAGCC	AGTTACCTTC	GGAAAAAGAG	TTGGTAGCTC	TTGATCCGGC	AAACAAACCA	7320
ACGACTTCGG	TCAATGGAAG	CCTTTTTCTC	AACCATCGAG	AACTAGGCCG	TTTGTTTGGT	7320
CCGCTGGTAG	CGGTGGTTTT	TTTGTTTGCA	AGCAGCAGAT	TACGCGCAGA	AAAAAAGGAT	7380
GGCGACCATC	GCCACCAAAA	AAACAAACGT	TCGTCGTCTA	ATGCGCGTCT	TTTTTTCCTA	7380
CTCAAGAAGA	TCCTTTGATC	TTTTCTACGG	GGTCTGACGC	TCAGTGGAAC	GAAAACTCAC	7440
GAGTTCTTCT	AGGAAACTAG	AAAAGATGCC	CCAGACTGCG	AGTCACCTTG	CTTTTGAGTG	7440
GTTAAGGGAT	TTTGGTCATG	AGATTATCAA	AAAGGATCTT	CACCTAGATC	CTTTTGCGGC	7500
CAATTCCCTA	AAACCAGTAC	TCTAATAGTT	TTTCCTAGAA	GTGGATCTAG	GAAAACGCCG	7500
CGCAAATCAA	TCTAAAGTAT	ATATGAGTAA	ACTTGGTCTG	ACAGTTACCA	ATGCTTAATC	7560
GCGTTTAGTT	AGATTTTATA	TATACTCATT	TGAACCAGAC	TGTCAATGGT	TACGAATTAG	7560
AGTGAGGCAC	CTATCTCAGC	GATCTGTCTA	TTTCGTTTCT	CCATAGTTGC	CTGACTCCCC	7620
TCACTCCGTG	GATAGAGTCG	CTAGACAGAT	AAAGCAAGTA	GGTATCAACG	GACTGAGGGG	7620
GTCGTGTAGA	TAACTACGAT	ACGGGAGGGC	TTACCATCTG	GCCCCAGTGC	TGCAATGATA	7680
CAGCACATCT	ATTGATGCTA	TGCCCTCCCG	AATGGTAGAC	CGGGGTCACG	ACGTTACTAT	7680
CCGCGAGACC	CACGCTCACC	GGCTCCAGAT	TTATCAGCAA	TAAACCAGCC	AGCCGGAAGG	7740
GGCGCTCTGG	GTGCGAGTGG	CCGAGGTCTA	AATAGTCGTT	ATTTGGTCGG	TCGGCCTTCC	7740
GCCGAGCGCA	GAAGTGGTCC	TGCAACTTTA	TCCGCCTCCA	TCCAGTCTAT	TAATTGTTGC	7800
CGGCTCGCGT	CTTCAACCAGG	ACGTTGAAAT	AGGCGGAGGT	AGGTCAGATA	ATTAACAACG	7800

FIG. 11B-10

pICAST ALN

CGGGAAGCTA	GAGTAAGTAG	TTCGCCAGTT	AATAGTTTGC	GCAACGTTGT	TGCCATTGCT	7860
GCCCTTCGAT	CTCATTCATC	AAGCGGTCAA	TTATCAAACG	CGTTGCAACA	ACGGTAACGA	7860
ACAGGCATCG	TGGTGTACAG	CTCGTCGTTT	GGTATGGCTT	CATTCAGCTC	CGGTTCCCAA	7920
TGTCCGTAGC	ACCACAGTGC	GAGCAGCAAA	CCATACCGAA	GTAAGTCGAG	GCCAAGGGTT	7920
CGATCAAGGC	GAGTTACATG	ATCCCCCATG	TTGTGCAAAA	AAGCGGTTAG	CTCCTTCGGT	7980
GCTAGTTCCG	CTCAATGTAC	TAGGGGGTAC	AACACGTTTT	TTCGCCAATC	GAGGAAGCCA	7980
CCTCCGATCG	TTGTCAGAAG	TAAGTTGGCC	GCAGTGTTAT	CACTCATGGT	TATGGCAGCA	8040
GGAGGCTAGC	AACAGTCTTC	ATTCAACCGG	CGTCACAATA	GTGAGTACCA	ATACCGTCGT	8040
CTGCATAATT	CTCTTACTGT	CATGCCATCC	GTAAGATGCT	TTTCTGTGAC	TGGTGAGTAC	8100
GACGTATTAA	GAGAATGACA	GTACGGTAGG	CATTCTACGA	AAAGACACTG	ACCACTCATG	8100
TCAACCAAGT	CATTCTGAGA	ATAGTGTATG	CGGCGACCGA	GTTGCTCTTG	CCCGGCGTCA	8160
AGTTGGTTCA	GTAAGACTCT	TATCACATAC	GCCGCTGGCT	CAACGAGAAC	GGGCCGCAGT	8160
ATACGGGATA	ATACCGCGCC	ACATAGCAGA	ACTTTAAAAG	TGCTCATCAT	TGGA AACGT	8220
TATGCCCTAT	TATGGCGCGG	TGTATCGTCT	TGAAATTTTC	ACGAGTAGTA	ACCTTTTGCA	8220
TCTTCGGGGC	GAAAACTCTC	AAGGATCTTA	CCGCTGTTGA	GATCCAGTTC	GATGTAACCC	8280
AGAAGCCCCG	CTTTTGAGAG	TTCCTAGAAT	GGCGACAAC	CTAGGTCAAG	CTACATTGGG	8280
ACTCGTGCAC	CCAACTGATC	TTCAGCATCT	TTTACTTTCA	CCAGCGTTTC	TGGGTGAGCA	8340
TGAGCACGTG	GGTTGACTAG	AAGTCGTAGA	AAATGAAAGT	GGTCGCAAAG	ACCCACTCGT	8340
AAACAGGAA	GGCAAAATGC	CGCAAAAAAG	GGAATAAGGG	CGACACGGAA	ATGTTGAATA	8400
TTTTGTCCTT	CCGTTTTTACG	GCGTTTTTTC	CCTTATTCCC	GCTGTGCCTT	TACAAC TTAT	8400
CTCATACTCT	TCCTTTTTCA	ATATTATTGA	AGCATTTATC	AGGGTTATTG	TCTCATGAGC	8460
GAGTATGAGA	AGGAAAAAGT	TATAATAACT	TCGTAAATAG	TCCCAATAAC	AGAGTACTCG	8460
GGATACATAT	TTGAATGTAT	TTAGAAAAAT	AAACAAATAG	GGGTTCCGCG	CACAT TTC	8518
CCTATGTATA	AACTTACATA	AATCTTTTTA	TTTGTTTATC	CCCAAGGCGC	GTGTAAAG	8518

FIG. 11B-11

09759152-052101
TOTAL 2576360

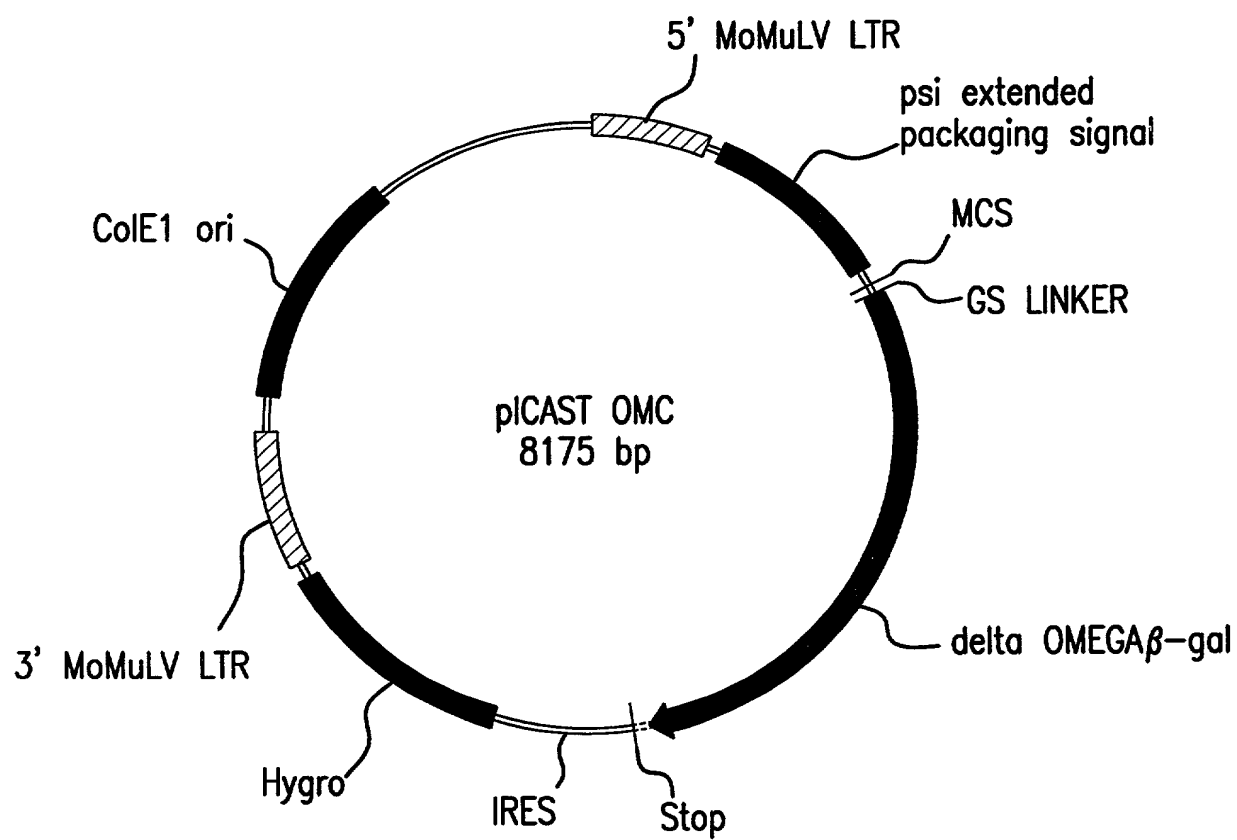


FIG.12A

pICAST OMC

CTGCAGCCTG AATATGGGCC AAACAGGATA TCTGTGGTAA GCAGTTCCTG CCCC GGCTCA	60
GACGTCGGAC TTATACCCGG TTTGTCCTAT AGACACCATT CGTCAAGGAC GGGGCCGAGT	60
GGGCCAAGAA CAGATGGAAC AGCTGAATAT GGGCCAAACA GGATATCTGT GGTAAGCAGT	120
CCCGGTTCTT GTCTACCTTG TCGACTTATA CCCGGTTTGT CCTATAGACA CCATTTCGTCA	120
TCCTGCCCCG GCTCAGGGCC AAGAACAGAT GGTCCCCAGA TCGGTCCAG CCCTCAGCAG	180
AGGACGGGGC CGAGTCCCGG TTCTTGTCTA CCAGGGGTCT ACGCCAGGTC GGGAGTCGTC	180
TTTCTAGAGA ACCATCAGAT GTTTCAGGG TGCCCAAGG ACCTGAAATG ACCCTGTGCC	240
AAAGATCTCT TGGTAGTCTA CAAAGGTCCC ACGGGTTCC TGGACTTTAC TGGGACACGG	240
TTATTTGAAC TAACCAATCA GTTCGCTTCT CGCTTCTGTT CGCGCGCTTC TGCTCCCCGA	300
AATAAACTTG ATTGGTTAGT CAAGCGAAGA GCGAAGACAA GCGCGCGAAG ACGAGGGGCT	300
GCTCAATAAA AGAGCCCACA ACCCCTCACT CGGGGCGCCA GTCCTCCGAT TGA CTGAGTC	360
CGAGTTATTT TCTCGGGTGT TGGGGAGTGA GCCCGCGGT CAGGAGGCTA ACTGACTCAG	360
GCCCGGGTAC CCGTGTATCC AATAAACCTT CTTGCAGTTG CATCCGACTT GTGGTCTCGC	420
CGGGCCCATG GGCACATAGG TTATTTGGGA GAACGTCAAC GTAGGCTGAA CACCAGAGCG	420
TGTTCCTTGG GAGGYTCTCC TCTGAGTGAT TGA CTACCCG TCAGCGGGGG TCTTTCATTT	480
ACAAGGAACC CTCCCAGAGG AGACTCACTA ACTGATGGGC AGTCGCCCC AGAAAGTAAA	480
GGGGGCTCGT CCGGGATCGG GAGACCCCTG CCCAGGGACC ACCGACCCAC CACCGGGAGG	540
CCCCGAGCA GGCCCTAGCC CTCTGGGGAC GGGTCCCTGG TGGCTGGGTG GTGGCCCTCC	540
CAAGCTGGCC AGCAACTTAT CTGTGTCTGT CCGATTGTCT AGTGTCTATG ACTGATTTTA	600
GTTCGACCGG TCGTTGAATA GACACAGACA GGCTAACAGA TCACAGATAC TGA CTAAAAT	600
TGCGCCTGCG TCGGTACTAG TTAGCTAACT AGCTCTGTAT CTGGCGGACC CGTGGTGGAA	660
ACGCGGACGC AGCCATGATC AATCGATTGA TCGAGACATA GACCGCCTGG GCACCACCTT	660
CTGACGAGTT CTGAACACCC GGCCGCAACC CTGGGAGACG TCCAGGGAC TTTGGGGGCC	720
GACTGCTCAA GACTTGTGGG CCGGCGTTGG GACCCTCTGC AGGGTCCCTG AAACCCCGG	720
GTTTTTGTGG CCCGACCTGA GGAAGGGAGT CGATGTGGAA TCCGACCCCG TCAGGATATG	780
CAAAACACC GGGCTGGACT CCTTCCCTCA GCTACACCTT AGGCTGGGGC AGTCCTATAC	780

FIG.12B-1

pICAST OMC

TGGTTCTGGT	AGGAGACGAG	AACCTAAAAC	AGTTCCTGCC	TCCGTCTGAA	TTTTTGCTTT	840
ACCAAGACCA	TCCTCTGCTC	TTGGATTTTG	TCAAGGGCGG	AGGCAGACTT	AAAAACGAAA	840
CGGTTTGGA	CCGAAGCCGC	GCGTCTTGTC	TGCTGCAGCA	TCGTTCTGTG	TTGTCTCTGT	900
GCCAAACCTT	GGCTTCGGCG	CGCAGAACAG	ACGACGTCGT	AGCAAGACAC	AACAGAGACA	900
CTGACTGTGT	TTCTGTATTT	GTCTGAAAAT	TAGGGCCAGA	CTGTTACCAC	TCCCTTAAGT	960
GACTGACACA	AAGACATAAA	CAGACTTTTA	ATCCCGGTCT	GACAATGGTG	AGGGAATTCA	960
TTGACCTTAG	GTAAGTGGAA	AGATGTCGAG	CGGCTCGCTC	ACAACCAGTC	GGTAGATGTC	1020
AACTGGAATC	CATTGACCTT	TCTACAGCTC	GCCGAGCGAG	TGTTGGTCAG	CCATCTACAG	1020
AAGAAGAGAC	GTTGGGTTAC	CTTCTGCTCT	GCAGAATGGC	CAACCTTTAA	CGTCGGATGG	1080
TTCTTCTCTG	CAACCCAATG	GAAGACGAGA	CGTCTTACCG	GTTGGAAATT	GCAGCCTACC	1080
CCGCGAGACG	GCACCTTTAA	CCGAGACCTC	ATCACCCAGG	TTAAGATCAA	GGTCTTTTCA	1140
GGCGCTCTGC	CGTGGAAATT	GGCTCTGGAG	TAGTGGGTCC	AATTCTAGTT	CCAGAAAAGT	1140
CCTGGCCCCG	ATGGACACCC	AGACCAGGTC	CCCTACATCG	TGACCTGGGA	AGCCTTGGCT	1200
GGACCGGGCG	TACCTGTGGG	TCTGGTCCAG	GGGATGTAGC	ACTGGACCCT	TCGGAACCGA	1200
TTTGACCCCC	CTCCCTGGGT	CAAGCCCTTT	GTACACCCTA	AGCCTCCGCC	TCCTCTTCCT	1260
AAACTGGGGG	GAGGGACCCA	GTTCCGGGAA	CATGTGGGAT	TCGGAGGCGG	AGGAGAAGGA	1260
CCATCCGCCC	CGTCTCTCCC	CCTTGAACCT	CCTCGTTCGA	CCCCGCCTCG	ATCCTCCCTT	1320
GGTAGGCGGG	GCAGAGAGGG	GGAACCTTGA	GGAGCAAGCT	GGGGCGGAGC	TAGGAGGGAA	1320
TATCCAGCCC	TCACTCCTTC	TCTAGGCGCC	GGCCGCTCTA	GCCCATTAA	ACGACTCACT	1380
ATAGGTCGGG	AGTGAGGAAG	AGATCCGCGG	CCGGCGAGAT	CGGGTAATTA	TGCTGAGTGA	1380
ATAGGGCGAT	TCGAATCAGG	CCTTGGCGCG	CCGGATCCTT	AATTAAGCGC	AATTGGGAGG	1440
TATCCCGCTA	AGCTTAGTCC	GGAACCGCGC	GGCCTAGGAA	TTAATTCGCG	TTAACCCTCC	1440
TGGCGGTAGC	CTCGAGATGG	GCGTGATTAC	GGATTCACTG	GCCGTCGTTT	TACAACGTCG	1500
ACCGCCATCG	GAGCTCTACC	CGCACTAATG	CCTAAGTGAC	CGGCAGCAAA	ATGTTGCAGC	1500
TGACTGGGAA	AACCCTGGCG	TTACCCAAC	TAATCGCCTT	GCAGCACATC	CCCCTTTCGC	1560
ACTGACCCTT	TTGGGACCGC	AATGGGTTGA	ATTAGCGGAA	CGTCGTGTAG	GGGGAAAGCG	1560

FIG.12B-2

pICAST OMC

CAGCTGGCGT	AATAGCGAAG	AGGCCCGCAC	CGATCGCCCT	TCCCAACAGT	TACGCAGCCT	1620
GTCGACCGCA	TTATCGCTTC	TCCGGGCGTG	GCTAGCGGGA	AGGGTTGTCA	ATGCGTCGGA	1620
GAATGGCGAA	TGGCGCTTTG	CCTGGTTTCC	GGCACCAGAA	GCGGTGCCGG	AAAGCTGGCT	1680
CTTACCGCTT	ACCGCGAAAC	GGACCAAAGG	CCGTGGTCTT	CGCCACGGCC	TTTCGACCGA	1680
GGAGTGCGAT	CTTCCTGAGG	CCGATACTGT	CGTCGTCCCC	TCAAACCTGGC	AGATGCACGG	1740
CCTCACGCTA	GAAGGACTCC	GGCTATGACA	GCAGCAGGGG	AGTTTGACCG	TCTACGTGCC	1740
TTACGATGCG	CCCATCTACA	CCAACGTGAC	CTATCCCATT	ACGGTCAATC	CGCCGTTTGT	1800
AATGCTACGC	GGGTAGATGT	GGTTGCACTG	GATAGGGTAA	TGCCAGTTAG	GCGGCAAACA	1800
TCCCACGGAG	AATCCGACGG	GTTGTTACTC	GCTCACATTT	AATGTTGATG	AAAGCTGGCT	1860
AGGGTGCCCTC	TTAGGCTGCC	CAACAATGAG	CGAGTGTAAG	TTACAACCTAC	TTTCGACCGA	1860
ACAGGAAGGC	CAGACGCGAA	TTATTTTTGA	TGGCGTTAAC	TCGGCGTTTC	ATCTGTGGTG	1920
TGTCCTTCCG	GTCTGCGCTT	AATAAAAACT	ACCGCAATTG	AGCCGCAAAG	TAGACACCAC	1920
CAACGGGCGC	TGGGTCGGTT	ACGGCCAGGA	CAGTCGTTTG	CCGTCTGAAT	TTGACCTGAG	1980
GTTGCCCGCG	ACCCAGCCAA	TGCCGGTCCT	GTCAGCAAAC	GGCAGACTTA	AACTGGACTC	1980
CGCATTTTTTA	CGCGCCGGAG	AAAACCGCCT	CGCGGTGATG	GTGCTGCGCT	GGAGTGACGG	2040
GCGTAAAAAT	GCGCGGCCTC	TTTTGGCGGA	GCGCCACTAC	CACGACGCGA	CCTCACTGCC	2040
CAGTTATCTG	GAAGATCAGG	ATATGTGGCG	GATGAGCGGC	ATTTTCCGTG	ACGTCTCGTT	2100
GTCAATAGAC	CTTCTAGTCC	TATACACCGC	CTACTCGCCG	TAAAAGGCAC	TGCAGAGCAA	2100
GCTGCATAAA	CCGACTACAC	AAATCAGCGA	TTTCCATGTT	GCCACTCGCT	TTAATGATGA	2160
CGACGTATTT	GGCTGATGTG	TTTAGTCGCT	AAAGGTACAA	CGGTGAGCGA	AATTACTACT	2160
TTTCAGCCGC	GCTGTACTGG	AGGCTGAAGT	TCAGATGTGC	GGCGAGTTGC	GTGACTACCT	2220
AAAGTCGGCG	CGACATGACC	TCCGACTTCA	AGTCTACACG	CCGCTCAACG	CACTGATGGA	2220
ACGGGTAACA	GTTTCTTTAT	GGCAGGGTGA	AACGCAGGTC	GCCAGCGGCA	CCGCGCCTTT	2280
TGCCATTGT	CAAAGAAATA	CCGTCCCACT	TTGCGTCCAG	CGGTGCGCGT	GGCGCGGAAA	2280
CGGCGGTGAA	ATTATCGATG	AGCGTGGTGG	TTATGCCGAT	CGCGTCACAC	TACGTCTGAA	2340
GCCGCCACTT	TAATAGCTAC	TCGCACCACC	AATACGGCTA	GCGCAGTGTG	ATGCAGACTT	2340

FIG.12B-3

pICAST OMC

CGTCGAAAAC	CCGAAACTGT	GGAGCGCCGA	AATCCCGAAT	CTCTATCGTG	CGGTGGTTGA	2400
GCAGCTTTTG	GGCTTTGACA	CCTCGCGGCT	TTAGGGCTTA	GAGATAGCAC	GCCACCAACT	2400
ACTGCACACC	GCCGACGGCA	CGCTGATTGA	AGCAGAAGCC	TGCGATGTCG	GTTTCCGCGA	2460
TGACGTGTGG	CGGCTGCCGT	GCGACTAACT	TCGTCTTCGG	ACGCTACAGC	CAAAGGCGCT	2460
GGTGCGGATT	GAAAATGGTC	TGCTGCTGCT	GAACGGCAAG	CCGTTGCTGA	TTCGAGGCGT	2520
CCACGCCTAA	CTTTTACCAG	ACGACGACGA	CTTGCCGTTC	GGCAACGACT	AAGCTCCGCA	2520
TAACCGTCAC	GAGCATCATC	CTCTGCATGG	TCAGGTCATG	GATGAGCAGA	CGATGGTGCA	2580
ATTGGCAGTG	CTCGTAGTAG	GAGACGTACC	AGTCCAGTAC	CTACTCGTCT	GCTACCACGT	2580
GGATATCCTG	CTGATGAAGC	AGAACAACCT	TAACGCCGTG	CGCTGTTCGC	ATTATCCGAA	2640
CCTATAGGAC	GACTACTTCG	TCTTGTTGAA	ATTGCGGCAC	GCGACAAGCG	TAATAGGCTT	2640
CCATCCGCTG	TGGTACACGC	TGTGCGACCG	CTACGGCCTG	TATGTGGTGG	ATGAAGCCAA	2700
GGTAGGCGAC	ACCATGTGCG	ACACGCTGGC	GATGCCGGAC	ATACACCACC	TACTTCGGTT	2700
TATTGAAACC	CACGGCATGG	TGCCAATGAA	TCGTCTGACC	GATGATCCGC	GCTGGCTACC	2760
ATAACTTTGG	GTGCCGTACC	ACGGTTACTT	AGCAGACTGG	CTACTAGGCG	CGACCGATGG	2760
GGCGATGAGC	GAACGCGTAA	CGCGAATGGT	GCAGCGCGAT	CGTAATCACC	CGAGTGTGAT	2820
CCGCTACTCG	CTTGCGCATT	GCGCTTACCA	CGTCGCGCTA	GCATTAGTGG	GCTCACACTA	2820
CATCTGGTCG	CTGGGGAATG	AATCAGGCCA	CGGCGCTAAT	CACGACGCGC	TGTATCGCTG	2880
GTAGACCAGC	GACCCCTTAC	TTAGTCCGGT	GCCGCGATTA	GTGCTGCGCG	ACATAGCGAC	2880
GATCAAATCT	GTCGATCCTT	CCCGCCCGGT	GCAGTATGAA	GGCGGCGGAG	CCGACACCAC	2940
CTAGTTTAGA	CAGCTAGGAA	GGGCGGGCCA	CGTCATACTT	CCGCCGCCTC	GGCTGTGGTG	2940
GGCCACCGAT	ATTATTTGCC	CGATGTACGC	GCGCGTGGAT	GAAGACCAGC	CCTTCCCGGC	3000
CCGGTGGCTA	TAATAAACGG	GCTACATGCG	GCGCACCTA	CTTCTGGTCG	GGAAGGGCCG	3000
TGTGCCGAAA	TGGTCCATCA	AAAAATGGCT	TTCGCTACCT	GGAGAGACGC	GCCCGCTGAT	3060
ACACGGCTTT	ACCAGGTAGT	TTTTTACCGA	AAGCGATGGA	CCTCTCTGCG	CGGGCGACTA	3060
CCTTTGCGAA	TACGCCCACG	CGATGGGTAA	CAGTCTTGGC	GGTTTCGCTA	AATACTGGCA	3120
GGAAACGCTT	ATGCGGGTGC	GCTACCCATT	GTCAGAACCG	CCAAAGCGAT	TTATGACCGT	3120

FIG.12B-4

pICAST OMC

GGCGTTTCGT	CAGTATCCCC	GTTTACAGGG	CGGCTTCGTC	TGGGACTGGG	TGGATCAGTC	3180
CCGCAAAGCA	GTCATAGGGG	CAAATGTCCC	GCCGAAGCAG	ACCCTGACCC	ACCTAGTCAG	3180
GCTGATTAAA	TATGATGAAA	ACGGCAACCC	GTGGTCGGCT	TACGGCGGTG	ATTTTGGCGA	3240
CGACTAATTT	ATACTACTTT	TGCCGTTGGG	CACCAGCCGA	ATGCCGCCAC	TAAAACCGCT	3240
TACGCCGAAC	GATCGCCAGT	TCTGTATGAA	CGGTCTGGTC	TTTGCCGACC	GCACGCCGCA	3300
ATGCGGCTTG	CTAGCGGTCA	AGACATACTT	GCCAGACCAG	AAACGGCTGG	CGTGCGGCGT	3300
TCCAGCGCTG	ACGGAAGCAA	AACACCAGCA	GCAGTTTTTC	CAGTTCCGTT	TATCCGGGCA	3360
AGGTCGCGAC	TGCCTTCGTT	TTGTGGTCGT	CGTCAAAAAG	GTCAAGGCAA	ATAGGCCCGT	3360
AACCATCGAA	GTGACCAGCG	AATACCTGTT	CCGTCATAGC	GATAACGAGC	TCCTGCACTG	3420
TTGGTAGCTT	CACTGGTCGC	TTATGGACAA	GGCAGTATCG	CTATTGCTCG	AGGACGTGAC	3420
GATGGTGGCG	CTGGATGGTA	AGCCGCTGGC	AAGCGGTGAA	GTGCCTCTGG	ATGTCGCTCC	3480
CTACCACCGC	GACCTACCAT	TCGGCGACCG	TTCGCCACTT	CACGGAGACC	TACAGCGAGG	3480
ACAAGGTAAG	CAGTTGATTG	AACTGCCTGA	ACTACCGCAG	CCGGAGAGCG	CCGGGCAACT	3540
TGTTCCATTT	GTCAACTAAC	TTGACGGACT	TGATGGCGTC	GGCCTCTCGC	GGCCCGTTGA	3540
CTGGCTCACA	GTACGCGTAG	TGCAACCGAA	CGCGACCGCA	TGGTCAGAAG	CCGGGCACAT	3600
GACCGAGTGT	CATGCGCATC	ACGTTGGCTT	GCGCTGGCGT	ACCAGTCTTC	GGCCCGTGTA	3600
CAGCGCCTGG	CAGCAGTGGC	GTCTGGCGGA	AAACCTCAGT	GTGACGCTCC	CCGCCGCGTC	3660
GTCGCGGACC	GTCGTCACCG	CAGACCGCCT	TTTGGAGTCA	CACTGCGAGG	GGCGGCGCAG	3660
CCACGCCATC	CCGCATCTGA	CCACCAGCGA	AATGGATTTT	TGCATCGAGC	TGGGTAATAA	3720
GGTGCGGTAG	GGCGTAGACT	GGTGGTCGCT	TTACCTAAAA	ACGTAGCTCG	ACCCATTATT	3720
GCGTTGGCAA	TTTAACCGCC	AGTCAGGCTT	TCTTTCACAG	ATGTGGATTG	GCGATAAAAA	3780
CGCAACCGTT	AAATTGGCGG	TCAGTCCGAA	AGAAAGTGTC	TACACCTAAC	CGCTATTTTT	3780
ACAACCTGCTG	ACGCCGCTGC	GCGATCAGTT	CACCCGTGTC	GATAGATCTG	AACAGAAACT	3840
TGTTGACGAC	TGCGGCGACG	CGCTAGTCAA	GTGGGCACAG	CTATCTAGAC	TTGTCTTTGA	3840
CATTTCCGAA	GAAGACCTAG	TCGACCATCA	TCATCATCAT	CACCGGTAAT	AATAGGTAGA	3900
GTAAGGCTT	CTTCTGGATC	AGCTGGTAGT	AGTAGTAGTA	GTGGCCATTA	TTATCCATCT	3900

FIG. 12B-5

pICAST OMC

TAAGTGACTG	ATTAGATGCA	TTTCGACTAG	ATCCCTCGAC	CAATTCCGGT	TATTTTCCAC	3960
ATTCACTGAC	TAATCTACGT	AAAGCTGATC	TAGGGAGCTG	GTAAAGGCCA	ATAAAAGGTG	3960
CATATTGCCG	TCTTTTGGCA	ATGTGAGGGC	CCGGAAACCT	GGCCCTGTCT	TCTTGACGAG	4020
GTATAACGGC	AGAAAACCGT	TACTCTCCCG	GGCCTTTGGA	CCGGGACAGA	AGAACTGCTC	4020
CATTCTAGG	GGTCTTTCCC	CTCTCGCCAA	AGGAATGCAA	GGTCTGTTGA	ATGTCGTGAA	4080
GTAAGGATCC	CCAGAAAGGG	GAGAGCGGTT	TCCTTACGTT	CCAGACAACT	TACAGCACTT	4080
GGAAGCAGTT	CCTCTGGAAG	CTTCTTGAAG	ACAAACAACG	TCTGTAGCGA	CCCTTTGCAG	4140
CCTTCGTCAA	GGAGACCTTC	GAAGAACTTC	TGTTTGTTGC	AGACATCGCT	GGGAAACGTC	4140
GCAGCGGAAC	CCCCCACCTG	GCGACAGGTG	CCTCTGCGGC	CAAAAGCCAC	GTGTATAAGA	4200
CGTCGCCTTG	GGGGGTGGAC	CGCTGTCCAC	GGAGACGCCG	GTTTTCGGTG	CACATATTCT	4200
TACACCTGCA	AAGGCGGCAC	AACCCAGTG	CCACGTTGTG	AGTTGGATAG	TTGTGGAAAG	4260
ATGTGGACGT	TTCCGCCGTG	TTGGGGTCAC	GGTGCAACAC	TCAACCTATC	AACACCTTTC	4260
AGTCAAATGG	CTCTCCTCAA	GCGTATTCAA	CAAGGGGCTG	AAGGATGCCC	AGAAGGTACC	4320
TCAGTTTACC	GAGAGGAGTT	CGCATAAGTT	GTTCCCCGAC	TTCCTACGGG	TCTTCCATGG	4320
CCATTGTATG	GGATCTGATC	TGGGGCCTCG	GTGCACATGC	TTTACATGTG	TTTAGTCGAG	4380
GGTAACATAC	CCTAGACTAG	ACCCCGGAGC	CACGTGTACG	AAATGTACAC	AAATCAGCTC	4380
GTAAAAAAC	GTCTAGGCCC	CCCGAACCAC	GGGGACGTGG	TTTTCCTTTG	AAAAACACGA	4440
CAATTTTTTG	CAGATCCGGG	GGGCTTGGTG	CCCCTGCACC	AAAAGGAAAC	TTTTTGTGCT	4440
TGATAATACC	ATGAAAAAGC	CTGAACTCAC	CGCGACGTCT	GTCGAGAAGT	TTCTGATCGA	4500
ACTATTATGG	TACTTTTTTCG	GACTTGAGTG	GCGCTGCAGA	CAGCTCTTCA	AAGACTAGCT	4500
AAAGTTCGAC	AGCGTCTCCG	ACCTGATGCA	GCTCTCGGAG	GGCGAAGAAT	CTCGTGCTTT	4560
TTTCAAGCTG	TCGCAGAGGC	TGGACTACGT	CGAGAGCCTC	CCGCTTCTTA	GAGCACGAAA	4560
CAGCTTCGAT	GTAGGAGGGC	GTGGATATGT	CCTGCGGGTA	AATAGCTGCG	CCGATGGTTT	4620
GTCGAAGCTA	CATCCTCCCG	CACCTATACA	GGACGCCCAT	TTATCGACGC	GGCTACCAAA	4620
CTACAAAGAT	CGTTATGTTT	ATCGGCACCTT	TGCATCGGCC	GCGCTCCCGA	TTCCGGAAGT	4680
GATGTTTCTA	GCAATACAAA	TAGCCGTGAA	ACGTAGCCGG	CGCGAGGGCT	AAGGCCTTCA	4680

FIG.12B-6

pICAST OMC

GCTTGACATT	GGGGAATTTA	GCGAGAGCCT	GACCTATTGC	ATCTCCCGCC	GTGCACAGGG	4740
CGAACTGTAA	CCCCTTAAAT	CGCRCTCGGA	CTGGATAACG	TAGAGGGCGG	CACGTGTCCC	4740
TGTCACGTTG	CAAGACCTGC	CTGAAACCGA	ACTGCCCCGT	GTTCTGCAGC	CGGTCGCGGA	4800
ACAGTGCAAC	GTTCTGGACG	GACTTTGGCT	TGACGGGCGA	CAAGACGTCG	GCCAGCGCCT	4800
GGCCATGGAT	GCGATCGCTG	CGGCCGATCT	TAGCCAGACG	AGCGGGTTCG	GCCCATTTCGG	4860
CCGGTACCTA	CGCTAGCGAC	GCCGGCTAGA	ATCGGTCTGC	TCGCCCAAGC	CGGGTAAGCC	4860
ACCGCAAGGA	ATCGGTCAAT	AACTACATG	GCGTGATTTT	ATATGCGCGA	TTGCTGATCC	4920
TGGCGTTCCT	TAGCCAGTTA	TGTGATGTAC	CGCACTAAAG	TATACGCGCT	AACGACTAGG	4920
CCATGTGTAT	CACTGGCAAA	CTGTGATGGA	CGACACCGTC	AGTGCGTCCG	TCGCGCAGGC	4980
GGTACACATA	GTGACCGTTT	GACACTACCT	GCTGTGGCAG	TCACGCAGGC	AGCGCGTCCG	4980
TCTCGATGAG	CTGATGCTTT	GGGCCGAGGA	CTGCCCCGAA	GTCCGGCACC	TCGTGCACGC	5040
AGAGCTACTC	GACTACGAAA	CCCGGCTCCT	GACGGGGCTT	CAGGCCGTGG	AGCACGTGCG	5040
GGATTTTCGGC	TCCAACAATG	TCCTGACGGA	CAATGGCCGC	ATAACAGCGG	TCATTGACTG	5100
CCTAAAGCCG	AGGTTGTTAC	AGGACTGCCT	GTTACCGGCG	TATTGTCGCC	AGTAACTGAC	5100
GAGCGAGGCG	ATGTTTCGGGG	ATTCCCAATA	CGAGGTCGCC	AACATCTTCT	TCTGGAGGCC	5160
CTCGCTCCGC	TACAAGCCCC	TAAGGGTTAT	GCTCCAGCGG	TTGTAGAAGA	AGACCTCCGG	5160
GTGGTTGGCT	TGTATGGAGC	AGCAGACGCG	CTACTTCGAG	CGGAGGCATC	CGGAGCTTGC	5220
CACCAACCGA	ACATACCTCG	TCGTCTGCGC	GATGAAGCTC	GCCTCCGTAG	GCCTCGAACG	5220
AGGATCGCCG	CGGCTCCGGG	CGTATATGCT	CCGCATTGGT	CTTGACCAAC	TCTATCAGAG	5280
TCCTAGCGGC	GCCGAGGCC	GCATATACGA	GGCGTAACCA	GAAGTCTTG	AGATAGTCTC	5280
CTTGGTTGAC	GGCAATTTTCG	ATGATGCAGC	TTGGGCGCAG	GGTCGATGCG	ACGCAATCGT	5340
GAACCAACTG	CCGTAAAGC	TACTACGTCG	AACCCGCGTC	CCAGCTACGC	TGCGTTAGCA	5340
CCGATCCGGA	GCCGGGACTG	TCGGGCGTAC	ACAAATCGCC	CGCAGAAGCG	CGGCCGTCTG	5400
GGCTAGGCCT	CGGCCCTGAC	AGCCCGCATG	TGTTTAGCGG	GCGTCTTCGC	GCCGGCAGAC	5400
GACCGATGGC	TGTGTAGAAG	TACTCGCCGA	TAGTGGAAC	CGACGCCCA	GCACTCGTCC	5460
CTGGCTACCG	ACACATCTTC	ATGAGCGGCT	ATCACCTTTG	GCTGCGGGGT	CGTGAGCAGG	5460

FIG.12B-7

pICAST OMC

GAGGGCAAAG	GAATAGAGTA	GATGCCGACC	GGGATCTATC	GATAAAATAA	AAGATTTTAT	5520
CTCCCGTTTC	CTTATCTCAT	CTACGGCTGG	CCCTAGATAG	CTATTTTATT	TTCTAAAATA	5520
TTAGTCTCCA	GAAAAAGGGG	GGAATGAAAG	ACCCACCTG	TAGGTTTGGC	AAGCTAGCTT	5580
AATCAGAGGT	CTTTTTCCCC	CCTTACTTTC	TGGGGTGGAC	ATCCAAACCG	TTCGATCGAA	5580
AAGTAACGCC	ATTTTGCAAG	GCATGGAAAA	ATACATAACT	GAGAATAGAG	AAGTTCAGAT	5640
TTCATTGCGG	TAAAACGTTT	CGTACCTTTT	TATGTATTGA	CTCTTATCTC	TTCAAGTCTA	5640
CAAGGTCAGG	AACAGATGGA	ACAGCTGAAT	ATGGGCCAAA	CAGGATATCT	GTGGTAAGCA	5700
GTTCCAGTCC	TTGTCTACCT	TGTCGACTTA	TACCCGGTTT	GTCCTATAGA	CACCATTCTG	5700
GTTCTGCCC	CGGCTCAGGG	CCAAGAACAG	ATGGAACAGC	TGAATATGGG	CCAAACAGGA	5760
CAAGGACGGG	GCCGAGTCCC	GGTTCTTGTC	TACCTTGTCG	ACTTATACCC	GGTTTGTCTT	5760
TATCTGTGGT	AAGCAGTTCC	TGCCCCGGCT	CAGGGCCAAG	AACAGATGGT	CCCCAGATGC	5820
ATAGACACCA	TTCGTCAAGG	ACGGGGCCGA	GTCCCGGTTT	TTGTCTACCA	GGGGTCTACG	5820
GGTCCAGCCC	TCAGCAGTTT	CTAGAGAACC	ATCAGATGTT	TCCAGGGTGC	CCCAAGGACC	5880
CCAGGTCGGG	AGTCGTCAAA	GATCTCTTGG	TAGTCTACAA	AGGTCCACG	GGGTTCTCTG	5880
TGAAATGACC	CTGTGCCTTA	TTTGAATAA	CCAATCAGTT	CGCTTCTCGC	TTCTGTTCGC	5940
ACTTTACTGG	GACACGGAAT	AACTTGATT	GGTTAGTCAA	GCGAAGAGCG	AAGACAAGCG	5940
GCGCTTCTGC	TCCCCGAGCT	CAATAAAAGA	GCCCACAACC	CCTCACTCGG	GGCGCCAGTC	6000
CGCGAAGACG	AGGGGCTCGA	GTTATTTTCT	CGGGTGTTGG	GGAGTGAGCC	CCGCGGTCAG	6000
CTCCGATTGA	CTGAGTCGCC	CGGGTACCCG	TGTATCCAAT	AAACCCTCTT	GCAGTTGCAT	6060
GAGGCTAACT	GACTCAGCGG	GCCCATGGGC	ACATAGGTTA	TTGGGAGAA	CGTCAACGTA	6060
CCGACTTGTG	GTCTCGCTGT	TCCTTGGGAG	GGTCTCCTCT	GAGTGATTGA	CTACCCGTCA	6120
GGCTGAACAC	CAGAGCGACA	AGGAACCCTC	CCAGAGGAGA	CTCACTAACT	GATGGGCAGT	6120
GCGGGGGTCT	TTCATTCATG	CAGCATGTAT	CAAAATTAAT	TTGGTTTTTT	TTCTTAAGTA	6180
CGCCCCCAGA	AAGTAAGTAC	GTCGTACATA	GTTTTAATTA	AACCACAAAA	AAGAATTCAT	6180
TTTACATTAA	ATGGCCATAG	TTGCATTAAT	GAATCGGCCA	ACGCGCGGGG	AGAGGCGGTT	6240
AAATGTAATT	TACCGGTATC	AACGTAATTA	CTAGCCGGT	TGCGCGCCCC	TCTCCGCCAA	6240

FIG.12B-8

pICAST OMC

TGCGTATTGG	CGCTCTTCCG	CTTCCTCGCT	CACTGACTCG	CTGCGCTCGG	TCGTTCCGGCT	6300
ACGCATAACC	GCGAGAAGGC	GAAGGAGCGA	GTGACTGAGC	GACGCGAGCC	AGCAAGCCGA	6300
GCGGCGAGCG	GTATCAGCTC	ACTCAAAGGC	GGTAATACGG	TTATCCACAG	AATCAGGGGA	6360
CGCCGCTCGC	CATAGTCGAG	TGAGTTTCCG	CCATTATGCC	AATAGGTGTC	TTAGTCCCCT	6360
TAACGCAGGA	AAGAACATGT	GAGCAAAAGG	CCAGCAAAAG	GCCAGGAACC	GTAAAAAGGC	6420
ATTGCGTCCT	TTCTTGTACA	CTCGTTTTCC	GGTCGTTTTC	CGGTCCTTGG	CATTTTTCCG	6420
CGCGTTGCTG	GCGTTTTTCC	ATAGGCTCCG	CCCCCTGAC	GAGCATCACA	AAAATCGACG	6480
GCGCAACGAC	CGCAAAAAGG	TATCCGAGGC	GGGGGGACTG	CTCGTAGTGT	TTTAGCTGC	6480
CTCAAGTCAG	AGGTGGCGAA	ACCCGACAGG	ACTATAAAGA	TACCAGGCGT	TTCCCCCTGG	6540
GAGTTCAGTC	TCCACCGCTT	TGGGCTGTCC	TGATATTTCT	ATGGTCCGCA	AAGGGGGACC	6540
AAGCTCCCTC	GTGCGCTCTC	CTGTTCCGAC	CCTGCCGCTT	ACCGGATACC	TGTCCGCCTT	6600
TTCGAGGGAG	CACGCGAGAG	GACAAGGCTG	GGACGGCGAA	TGGCCTATGG	ACAGGCGGAA	6600
TCTCCCTTCG	GGAAGCGTGG	CGCTTTCTCA	TAGCTCACGC	TGTAGGTATC	TCAGTTCGGT	6660
AGAGGGAAGC	CCTTCGCACC	GCGAAAGAGT	ATCGAGTGCG	ACATCCATAG	AGTCAAGCCA	6660
GTAGGTCGTT	CGCTCCAAGC	TGGGCTGTGT	GCACGAACCC	CCCGTTCAGC	CCGACCGCTG	6720
CATCCAGCAA	GCGAGGTTCG	ACCCGACACA	CGTGCTTGGG	GGGCAAGTCG	GGCTGGCGAC	6720
CGCCTTATCC	GGTAACTATC	GTCTTGAGTC	CAACCCGGTA	AGACACGACT	TATCGCCACT	6780
GCGGAATAGG	CCATTGATAG	CAGAACTCAG	GTTGGGCCAT	TCTGTGCTGA	ATAGCGGTGA	6780
GGCAGCAGCC	ACTGGTAACA	GGATTAGCAG	AGCGAGGTAT	GTAGGCGGTG	CTACAGAGTT	6840
CCGTCGTCGG	TGACCATTGT	CCTAATCGTC	TCGCTCCATA	CATCCGCCAC	GATGTCTCAA	6840
CTTGAAGTGG	TGGCCTAACT	ACGGCTACAC	TAGAAGAACA	GTATTTGGTA	TCTGCGCTCT	6900
GAACTTCACC	ACCGGATTGA	TGCCGATGTG	ATCTTCTTGT	CATAAACCAT	AGACGCGAGA	6900
GCTGAAGCCA	GTTACCTTCG	GAAAAAGAGT	TGGTAGCTCT	TGATCCGGCA	AACAAACCAC	6960
CGACTTCGGT	CAATGGAAGC	CTTTTTCTCA	ACCATCGAGA	ACTAGGCCGT	TTGTTTGGTG	6960
CGCTGGTAGC	GGTGGTTTTT	TTGTTTGCAA	GCAGCAGATT	ACGCGCAGAA	AAAAAGGATC	7020
GCGACCATCG	CCACCAAAAA	AACAAACGTT	CGTCGTCTAA	TGCGCGTCTT	TTTTTCCTAG	7020

FIG.12B-9

pICAST OMC

TCAAGAAGAT CCTTTGATCT TTTCTACGGG GTCTGACGCT CAGTGGAACG AAAACTCACG	7080
AGTTCTTCTA GGAAACTAGA AAAGATGCCC CAGACTGCGA GTCACCTTGC TTTTGAGTGC	7080
TTAAGGGATT TTGGTCATGA GATTATCAAA AAGGATCTTC ACCTAGATCC TTTTAAATTA	7140
AATTCCTTAA AACCAGTACT CTAATAGTTT TTCCTAGAAG TGGATCTAGG AAAATTTAAT	7140
AAAATGAAGT TTGCGGCCGC AAATCAATCT AAAGTATATA TGAGTAACT TGGTCTGACA	7200
TTTTACTTCA AACGCCGGCG TTTAGTTAGA TTTCATATAT ACTCATTTGA ACCAGACTGT	7200
GTTACCAATG CTTAATCAGT GAGGCACCTA TCTCAGCGAT CTGTCTATTT CGTTCATCCA	7260
CAATGGTTAC GAATTAGTCA CTCCGTGGAT AGAGTCGCTA GACAGATAAA GCAAGTAGGT	7260
TAGTTGCCTG ACTCCCCGTC GTGTAGATAA CTACGATACG GGAGGGCTTA CCATCTGGCC	7320
ATCAACGGAC TGAGGGGCGAG CACATCTATT GATGCTATGC CCTCCCGAAT GGTAGACCGG	7320
CCAGTGCTGC AATGATACCG CGAGACCCAC GCTCACCGGC TCCAGATTTA TCAGCAATAA	7380
GGTCACGACG TTAATATGGC GCTCTGGGTG CGAGTGGCCG AGGTCTAAAT AGTCGTTATT	7380
ACCAGCCAGC CGGAAGGGCC GAGCGCAGAA GTGGTCCTGC AACTTTATCC GCCTCCATCC	7440
TGGTCGGTCG GCCTTCCCGG CTCGCGTCTT CACCAGGACG TTGAAATAGG CGGAGGTAGG	7440
AGTCTATTAA TTGTTGCCGG GAAGCTAGAG TAAGTAGTTC GCCAGTTAAT AGTTTGCGCA	7500
TCAGATAATT AACAACGGCC CTTGATCTC ATTCATCAAG CGGTCAATTA TCAAACGCGT	7500
ACGTTGTTGC CATTGCTACA GGCATCGTGG TGTCACGCTC GTCGTTTGGT ATGGCTTCAT	7560
TGCAACAACG GTAACGATGT CCGTAGCACC ACAGTGCGAG CAGCAAACCA TACCGAAGTA	7560
TCAGCTCCGG TTCCCAACGA TCAAGGCGAG TTACATGATC CCCCATGTTG TGCAAAAAAG	7620
AGTCGAGGCC AAGGGTTGCT AGTTCCGCTC AATGTACTAG GGGGTACAAC ACGTTTTTTC	7620
CGGTTAGCTC CTTGCGTCCT CCGATCGTTG TCAGAAGTAA GTTGGCCGCA GTGTTATCAC	7680
GCCAATCGAG GAAGCCAGGA GGCTAGCAAC AGTCTTCATT CAACCGGCGT CACAATAGTG	7680
TCATGGTTAT GGCAGCACTG CATAATTCTC TTAATGTCAT GCCATCCGTA AGATGCTTTT	7740
AGTACCAATA CCGTCGTGAC GTATTAAGAG AATGACAGTA CGGTAGGCAT TCTACGAAAA	7740
CTGTGACTGG TGAGTACTCA ACCAAGTCAT TCTGAGAATA GTGTATGCGG CGACCGAGTT	7800
GACACTGACC ACTCATGAGT TGGTTCAGTA AGACTCTTAT CACATACGCC GCTGGGCTCA	7800

FIG.12B-10

pICAST OMC

GCTCTTGCCC	GGCGTCAATA	CGGGATAATA	CCGCGCCACA	TAGCAGAACT	TTAAAAGTGC	7860
CGAGAACGGG	CCGCAGTTAT	GCCCTATTAT	GGCGCGGTGT	ATCGTCTTGA	AATTTTCACG	7860
TCATCATTGG	AAAACGTTCT	TCGGGGCGAA	AACTCTCAAG	GATCTTACCG	CTGTTGAGAT	7920
AGTAGTAACC	TTTTGCAAGA	AGCCCCGCTT	TTGAGAGTTC	CTAGAATGGC	GACAACTCTA	7920
CCAGTTCGAT	GTAACCCACT	CGTGCACCCA	ACTGATCTTC	AGCATCTTTT	ACTTTCACCA	7980
GGTCAAGCTA	CATTGGGTGA	GCACGTGGGT	TGACTAGAAG	TCGTAGAAAA	TGAAAGTGGT	7980
GCGTTTCTGG	GTGAGCAAAA	ACAGGAAGGC	AAAATGCCGC	AAAAAAGGGA	ATAAGGGCGA	8040
CGCAAAGACC	CACTCGTTTT	TGTCCTTCCG	TTTTACGGCG	TTTTTCCCT	TATCCCGCT	8040
CACGGAAATG	TTGAATACTC	ATACTCTTCC	TTTTTCAATA	TTATTGAAGC	ATTTATCAGG	8100
GTGCCTTTAC	AACTTATGAG	TATGAGAAGG	AAAAAGTTAT	AATAACTTCG	TAAATAGTCC	8100
GTTATTGTCT	CATGAGCGGA	TACATATTTG	AATGTATTTA	GAAAAATAAA	CAAATAGGGG	8160
CAATAACAGA	GTA CTGCTT	ATGTATAAAC	TTACATAAAT	CTTTTTATTT	GTTTATCCCC	8160
TTCCGCGCAC	ATTTC					8175
AAGGCGCGTG	TAAAG					8175

FIG.12B-11

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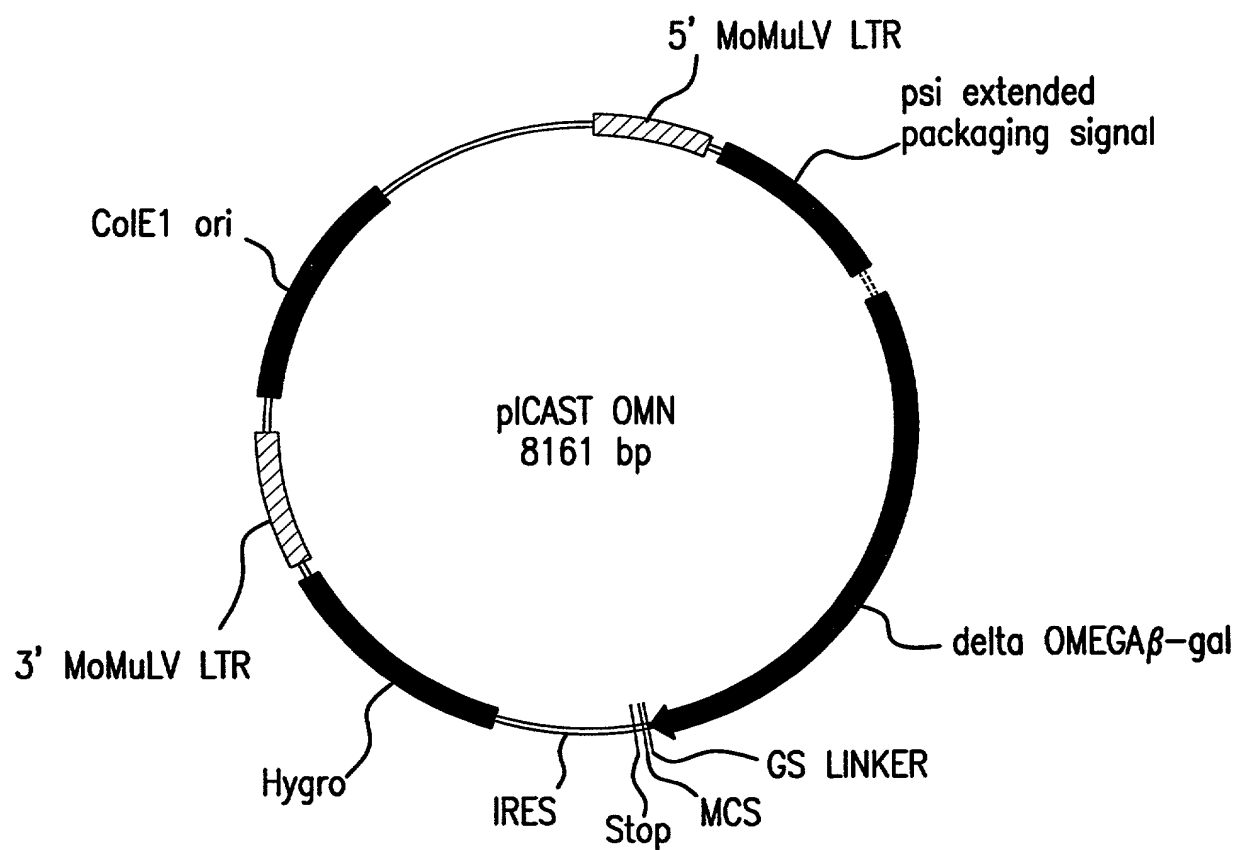


FIG.13A

pICAST OMN

CTGCAGCCTG	AATATGGGCC	AAACAGGATA	TCTGTGGTAA	GCAGTTCCTG	CCCCGGCTCA	60
GACGTCGGAC	TTATACCCGG	TTTGTCTAT	AGACACCATT	CGTCAAGGAC	GGGGCCGAGT	60
GGGCCAAGAA	CAGATGGAAC	AGCTGAATAT	GGGCCAAACA	GGATATCTGT	GGTAAGCAGT	120
CCCGGTTCTT	GTCTACCTTG	TCGACTTATA	CCCGGTTTGT	CCTATAGACA	CCATTTCGTCA	120
TCCTGCCCCG	GCTCAGGGCC	AAGAACAGAT	GGTCCCCAGA	TGCGGTCCAG	CCCTCAGCAG	180
AGGACGGGGC	CGAGTCCCGG	TTCTTGTCTA	CCAGGGGTCT	ACGCCAGGTC	GGGAGTCGTC	180
TTTCTAGAGA	ACCATCAGAT	GTTTCCAGGG	TGCCCCAAGG	ACCTGAAATG	ACCCTGTGCC	240
AAAGATCTCT	TGGTAGTCTA	CAAAGGTCCC	ACGGGGTTCC	TGGACTTTAC	TGGGACACGG	240
TTATTTGAAC	TAACCAATCA	GTTCGCTTCT	CGCTTCTGTT	CGCGCGCTTC	TGCTCCCCGA	300
AATAAACTTG	ATTGGTTAGT	CAAGCGAAGA	GCGAAGACAA	GCGCGCGAAG	ACGAGGGGCT	300
GCTCAATAAA	AGAGCCCACA	ACCCCTCACT	CGGGGCGCCA	GTCCTCCGAT	TGACTGAGTC	360
CGAGTTATTT	TCTCGGGTGT	TGGGGAGTGA	GCCCCGCGGT	CAGGAGGCTA	ACTGACTCAG	360
GCCCGGGTAC	CCGTGTATCC	AATAAACCCCT	CTTGCAGTTG	CATCCGACTT	GTGGTCTCGC	420
CGGGCCCATG	GGCACATAGG	TTATTTGGGA	GAACGTCAAC	GTAGGCTGAA	CACCAGAGCG	420
TGTTCCCTTG	GAGGGTCTCC	TCTGAGTGAT	TGACTACCCG	TCAGCGGGGG	TCTTTCATTT	480
ACAAGGAACC	CTCCCAGAGG	AGACTCACTA	ACTGATGGGC	AGTCGCCCCC	AGAAAGTAAA	480
GGGGGCTCGT	CCGGGATCGG	GAGACCCCTG	CCCAGGGACC	ACCGACCCAC	CACCGGGAGG	540
CCCCCGAGCA	GGCCCTAGCC	CTCTGGGGAC	GGGTCCCTGG	TGGCTGGGTG	GTGGCCCTCC	540
CAAGCTGGCC	AGCAACTTAT	CTGTGTCTGT	CCGATTGTCT	AGTGTCTATG	ACTGATTTTA	600
GTTTCGACCG	TCGTTGAATA	GACACAGACA	GGCTAACAGA	TCACAGATAC	TGACTAAAAT	600
TGCGCCTGCG	TCGGTACTAG	TTAGCTAACT	AGCTCTGTAT	CTGGCGGACC	CGTGGTGGAA	660
ACGCGGACGC	AGCCATGATC	AATCGATTGA	TCGAGACATA	GACCGCCTGG	GCACCACCTT	660
CTGACGAGTT	CTGAACACCC	GGCCGCAACC	CTGGGAGACG	TCCCAGGGAC	TTTGGGGGCC	720
GACTGCTCAA	GACTTGTGGG	CCGGCGTTGG	GACCCTCTGC	AGGGTCCCTG	AAACCCCCGG	720
GTTTTTGTGG	CCCGACCTGA	GGAAGGGAGT	CGATGTGGAA	TCCGACCCCG	TCAGGATATG	780
CAAAAACACC	GGGCTGGACT	CCTTCCCTCA	GCTACACCTT	AGGCTGGGGC	AGTCCTATAC	780

FIG.13B-1

pICAST OMN

TGGTTCTGGT	AGGAGACGAG	AACCTAAAC	AGTTCCCGCC	TCCGTCTGAA	TTTTTGCTTT	840
ACCAAGACCA	TCCTCTGCTC	TTGGATTTTG	TCAAGGGCGG	AGGCAGACTT	AAAAACGAAA	840
CGGTTTGGAA	CCGAAGCCGC	GCGTCTTGTC	TGCTGCAGCA	TCGTTCTGTG	TTGTCTCTGT	900
GCCAAACCTT	GGCTTCGGCG	CGCAGAACAG	ACGACGTCGT	AGCAAGACAC	AACAGAGACA	900
CTGACTGTGT	TTCTGTATTT	GTCTGAAAAT	TAGGGCCAGA	CTGTTACCAC	TCCCTTAAGT	960
GACTGACACA	AAGACATAAA	CAGACTTTTA	ATCCCGGTCT	GACAATGGTG	AGGGAATTCA	960
TTGACCTTAG	GTAAGTGGAA	AGATGTCGAG	CGGCTCGCTC	ACAACCAGTC	GGTAGATGTC	1020
AACTGGAATC	CATTGACCTT	TCTACAGCTC	GCCGAGCGAG	TGTTGGTCAG	CCATCTACAG	1020
AAGAAGAGAC	GTTGGGTTAC	CTTCTGCTCT	GCAGAATGGC	CAACCTTTAA	CGTCGGATGG	1080
TTCTTCTCTG	CAACCCAATG	GAAGACGAGA	CGTCTTACCG	GTTGGAAATT	GCAGCCTACC	1080
CCGCGAGACG	GCACCTTTAA	CCGAGACCTC	ATCACCCAGG	TTAAGATCAA	GGTCTTTTCA	1140
GGCGCTCTGC	CGTGGAAATT	GGCTCTGGAG	TAGTGGGTCC	AATTCTAGTT	CCAGAAAAGT	1140
CCTGGCCCCG	ATGGACACCC	AGACCAGGTC	CCCTACATCG	TGACCTGGGA	AGCCTTGGCT	1200
GGACCGGGCG	TACCTGTGGG	TCTGGTCCAG	GGGATGTAGC	ACTGGACCCT	TCGGAACCGA	1200
TTTGACCCCC	CTCCCTGGGT	CAAGCCCTTT	GTACACCCTA	AGCCTCCGCC	TCCTCTTCCT	1260
AAACTGGGGG	GAGGGACCCA	GTTCCGGGAA	CATGTGGGAT	TCGGAGGCGG	AGGAGAAGGA	1260
CCATCCGCCC	CGTCTCTCCC	CCTTGAACCT	CCTCGTTCGA	CCCCGCCTCG	ATCCTCCCTT	1320
GGTAGGCGGG	GCAGAGAGGG	GGAAC TTGGA	GGAGCAAGCT	GGGGCGGAGC	TAGGAGGGAA	1320
TATCCAGCCC	TCACTCCTTC	TCTAGGCGCC	GGCCGCTCTA	GCCCATTAAT	ACGACTCACT	1380
ATAGGTCGGG	AGTGAGGAAG	AGATCCGCGG	CCGGCGAGAT	CGGGTAATTA	TGCTGAGTGA	1380
ATAGGGCGAT	TCGAACACCA	TGCACCATCA	TCATCATCAC	GTCGACGAAC	AGAAACTCAT	1440
TATCCCGCTA	AGCTTG TGGT	ACGTGGTAGT	AGTAGTAGTG	CAGCTGCTTG	TCTTTGAGTA	1440
TTCCGAAGAA	GACCTACTCG	AGATGGGCGT	GATTACGGAT	TACTGGCCG	TCGTTTTACA	1500
AAGGCTTCTT	CTGGATGAGC	TCTACCCGCA	CTAATGCCTA	AGTGACCGGC	AGCAAAATGT	1500
ACGTCGTGAC	TGGGAAAACC	CTGGCGTTAC	CCAACTTAAT	CGCCTTG CAG	CACATCCCCC	1560
TGCAGCACTG	ACCCTTTTGG	GACCGCAATG	GGTTGAATTA	GCGGAACGTC	GTGTAGGGGG	1560

FIG.13B-2

pICAST OMN

TTTCGCCAGC	TGGCGTAATA	GCGAAGAGGC	CCGCACCGAT	CGCCCTTCCC	AACAGTTACG	1620
AAAGCGGTCG	ACCGCATTAT	CGCTTCTCCG	GGCGTGGCTA	GCGGGAAGGG	TTGTCAATGC	1620
CAGCCTGAAT	GGCGAATGGC	GCTTTGCCTG	GTTTCCGGCA	CCAGAAGCGG	TGCCGGAAAG	1680
GTCGGACTTA	CCGCTTACCG	CGAAACGGAC	CAAAGGCCGT	GGTCTTCGCC	ACGGCCTTTC	1680
CTGGCTGGAG	TGCGATCTTC	CTGAGGCCGA	TACTGTCGTC	GTCCCCTCAA	ACTGGCAGAT	1740
GACCGACCTC	ACGCTAGAAG	GACTCCGGCT	ATGACAGCAG	CAGGGGAGTT	TGACCGTCTA	1740
GCACGGTTAC	GATGCGCCCA	TCTACACCAA	CGTGACCTAT	CCCATTACGG	TCAATCCGCC	1800
CGTGCCAATG	CTACGCGGGT	AGATGTGGTT	GCACTGGATA	GGGTAATGCC	AGTTAGGCGG	1800
GTTTGTTCCC	ACGGAGAATC	CGACGGGTTG	TACTCGCTC	ACATTTAATG	TTGATGAAAG	1860
CAAACAAGGG	TGCCTCTTAG	GCTGCCCAAC	AATGAGCGAG	TGTAAATTAC	AACTACTTTC	1860
CTGGCTACAG	GAAGGCCAGA	CGCGAATTAT	TTTTGATGGC	GTAACTCGG	CGTTTCATCT	1920
GACCGATGTC	CTTCCGGTCT	GCGCTTAATA	AAAACCTACG	CAATTGAGCC	GCAAAGTAGA	1920
GTGGTGCAAC	GGGCGCTGGG	TCGGTTACGG	CCAGGACAGT	CGTTTGCCGT	CTGAATTTGA	1980
CACCACGTTG	CCGCGGACCC	AGCCAATGCC	GGTCCTGTCA	GCAAACGGCA	GACTTAAACT	1980
CCTGAGCGCA	TTTTTACGCG	CCGGAGAAAA	CCGCCTCGCG	GTGATGGTGC	TGCGCTGGAG	2040
GGACTCGCGT	AAAAATGCGC	GGCCTCTTTT	GGCGGAGCGC	CACTACCACG	ACGCGACCTC	2040
TGACGGCAGT	TATCTGGAAG	ATCAGGATAT	GTGGCGGATG	AGCGGCATTT	TCCGTGACGT	2100
ACTGCCGTCA	ATAGACCTTC	TAGTCCTATA	CACCGCCTAC	TCGCCGTAAA	AGGCACTGCA	2100
CTCGTTGCTG	CATAAACCGA	CTACACAAAT	CAGCGATTTT	CATGTTGCCA	CTCGCTTTAA	2160
GAGCAACGAC	GTATTTGGCT	GATGTGTTTA	GTCGCTAAAG	GTACAACGGT	GAGCGAAATT	2160
TGATGATTTT	AGCCGCGCTG	TACTGGAGGC	TGAAGTTCAG	ATGTGCGGCG	AGTTGCGTGA	2220
ACTACTAAAG	TCGGCGCGAC	ATGACCTCCG	ACTTCAAGTC	TACACGCCGC	TCAACGCACT	2220
CTACCTACGG	GTAACAGTTT	CTTTATGGCA	GGGTGAAACG	CAGGTCGCCA	GCGGCACCGC	2280
GATGGATGCC	CATTGTCAAA	GAAATACCGT	CCCACTTTGC	GTCCAGCGGT	CGCCGTGGCG	2280
GCCTTTCGGC	GGTGAAATTA	TCGATGAGCG	TGGTGGTTAT	GCCGATCGCG	TCACACTACG	2340
CGGAAAGCCG	CCACTTTAAT	AGCTACTCGC	ACCACCAATA	CGGCTAGCGC	AGTGTGATGC	2340

FIG. 13B-3

pICAST OMN

TCTGAACGTC	GAAAACCCGA	AACTGTGGAG	CGCCGAAATC	CCGAATCTCT	ATCGTGCGGT	2400
AGACTTGCAG	CTTTTGGGCT	TTGACACCTC	GCGGCTTTAG	GGCTTAGAGA	TAGCACGCCA	2400
GGTTGAACTG	CACACCGCCG	ACGGCACGCT	GATTGAAGCA	GAAGCCTGCG	ATGTCGGTTT	2460
CCAACTTGAC	GTGTGGCGGC	TGCCGTGCGA	CTAACTTCGT	CTTCGGACGC	TACAGCCAAA	2460
CCGCGAGGTG	CGGATTGAAA	ATGGTCTGCT	GCTGCTGAAC	GGCAAGCCGT	TGCTGATTCTG	2520
GGCGCTCCAC	GCCTAACTTT	TACCAGACGA	CGACGACTTG	CCGTTTCGGCA	ACGACTAAGC	2520
AGGCGTTAAC	CGTCACGAGC	ATCATCCTCT	GCATGGTCAG	GTCATGGATG	AGCAGACGAT	2580
TCCGCAATTG	GCAGTGCTCG	TAGTAGGAGA	CGTACCAGTC	CAGTACCTAC	TCGTCTGCTA	2580
GGTGCAGGAT	ATCCTGCTGA	TGAAGCAGAA	CAACTTTAAC	GCCGTGCGCT	GTTCGCATTA	2640
CCACGTCCTA	TAGGACGACT	ACTTCGTCTT	GTTGAAATTG	CGGCACGCGA	CAAGCGTAAT	2640
TCCGAACCAT	CCGCTGTGGT	ACACGCTGTG	CGACCGCTAC	GGCCTGTATG	TGGTGGATGA	2700
AGGCTTG GTA	GGCGACACCA	TGTGCGACAC	GCTGGCGATG	CCGGACATAC	ACCACCTACT	2700
AGCCAATATT	GAAACCCACG	GCATGGTGCC	AATGAATCGT	CTGACCGATG	ATCCGCGCTG	2760
TCGGTTATAA	CTTTGGGTGC	CGTACCACGG	TTACTTAGCA	GACTGGCTAC	TAGGCGCGAC	2760
GCTACCGGCG	ATGAGCGAAC	GCGTAACGCG	AATGGTG CAG	CGCGATCGTA	ATCACCCGAG	2820
CGATGGCCGC	TACTCGCTTG	CGCATTGCGC	TTACCACGTC	GCGCTAGCAT	TAGTGGGCTC	2820
TGTGATCATC	TGGTCGCTGG	GGAATGAATC	AGGCCACGGC	GCTAATCACG	ACGCGCTGTA	2880
ACACTAGTAG	ACCAGCGACC	CCTTACTTAG	TCCGGTGCCG	CGATTAGTGC	TGCGCGACAT	2880
TCGCTGGATC	AAATCTGTCTG	ATCCTTCCCG	CCCGGTGCAG	TATGAAGGCG	GCGGAGCCGA	2940
AGCGACCTAG	TTTAGACAGC	TAGGAAGGGC	GGGCCACGTC	ATACTTCCGC	CGCCTCGGCT	2940
CACCACGGCC	ACCGATATTA	TTTGCCCGAT	GTACGCGCGC	GTGGATGAAG	ACCAGCCCTT	3000
GTGGTGCCGG	TGGCTATAAT	AAACGGGCTA	CATGCGCGCG	CACCTACTTC	TGGTCGGGAA	3000
CCCGGCTGTG	CCGAAATGGT	CCATCAAAAA	ATGGCTTTCTG	CTACCTGGAG	AGACGCGCCC	3060
GGGCCGACAC	GGCTTTACCA	GGTAGTTTTT	TACCGAAAGC	GATGGACCTC	TCTGCGCGGG	3060
GCTGATCCTT	TGCGAATACG	CCCACGCGAT	GGGTAACAGT	CTTGGCGGTT	TCGCTAAATA	3120
CGACTAGGAA	ACGCTTATGC	GGGTGCGCTA	CCCATTGTCA	GAACCGCCAA	AGCGATTTAT	3120

FIG. 13B-4

pICAST OMN

CTGGCAGGCG	TTTCGTCAGT	ATCCCCGTTT	ACAGGGCGGC	TTCGTCTGGG	ACTGGGTGGA	3180
GACCGTCCGC	AAAGCAGTCA	TAGGGGCAAA	TGTCCCGCCG	AAGCAGACCC	TGACCCACCT	3180
TCAGTCGCTG	ATTAAATATG	ATGAAAACGG	CAACCCGTGG	TCGGCTTACG	GCGGTGATTT	3240
AGTCAGCGAC	TAATTTATAC	TACTTTTGCC	GTTGGGCACC	AGCCGAATGC	CGCCACTAAA	3240
TGGCGATACG	CCGAACGATC	GCCAGTTCTG	TATGAACGGT	CTGGTCTTTG	CCGACCGCAC	3300
ACCGCTATGC	GGCTTGCTAG	CGGTCAAGAC	ATACTTGCCA	GACCAGAAAC	GGCTGGCGTG	3300
GCCGCATCCA	GCGCTGACGG	AAGCAAAACA	CCAGCAGCAG	TTTTTCCAGT	TCCGTTTATC	3360
CGGCGTAGGT	CGCGACTGCC	TTCGTTTTGT	GGTCGTCGTC	AAAAAGGTCA	AGGCAAATAG	3360
CGGGCAAACC	ATCGAAGTGA	CCAGCGAATA	CCTGTTCCGT	CATAGCGATA	ACGAGCTCCT	3420
GCCCGTTTGG	TAGCTTCACT	GGTCGCTTAT	GGACAAGGCA	GTATCGCTAT	TGCTCGAGGA	3420
GCACTGGATG	GTGGCGCTGG	ATGGTAAGCC	GCTGGCAAGC	GGTGAAGTGC	CTCTGGATGT	3480
CGTGACCTAC	CACCGCGACC	TACCATTGCG	CGACCGTTTC	CCACTTCACG	GAGACCTACA	3480
CGCTCCACAA	GGTAAACAGT	TGATTGAACT	GCCTGAACTA	CCGCAGCCGG	AGAGCGCCGG	3540
GCGAGGTGTT	CCATTTGTCA	ACTAACTTGA	CGGACTTGAT	GGCGTCGGCC	TCTCGCGGCC	3540
GCAACTCTGG	CTCACAGTAC	GCGTAGTGCA	ACCGAACGCG	ACCGCATGGT	CAGAAGCCGG	3600
CGTTGAGACC	GAGTGTATG	CGCATCACGT	TGGCTTGCGC	TGGCGTACCA	GTCTTCGGCC	3600
GCACATCAGC	GCCTGGCAGC	AGTGGCGTCT	GGCGGAAAAC	CTCAGTGTGA	CGCTCCCCGC	3660
CGTGTAGTCG	CGGACCGTCG	TCACCGCAGA	CCGCCTTTTG	GAGTCACACT	GCGAGGGGCG	3660
CGCGTCCCAC	GCCATCCCCG	ATCTGACCAC	CAGCGAAATG	GATTTTTGCA	TCGAGCTGGG	3720
GCGCAGGGTG	CGGTAGGGCG	TAGACTGGTG	GTCGCTTTAC	CTAAAAACGT	AGCTCGACCC	3720
TAATAAGCGT	TGGCAATTTA	ACCGCCAGTC	AGGCTTTCTT	TCACAGATGT	GGATTGGCGA	3780
ATTATTCGCA	ACCGTTAAAT	TGGCGGTCAG	TCCGAAAGAA	AGTGTCTACA	CCTAACCGCT	3780
TAAAAAACAA	CTGCTGACGC	CGCTGCGCGA	TCAGTTCACC	CGTGTCGATA	GATCTGGAGG	3840
ATTTTTTGTT	GACGACTGCG	GCGACGCGCT	AGTCAAGTGG	GCACAGCTAT	CTAGACCTCC	3840
TGGTGGCAGC	AGGCCTTGGC	GCGCCGGATC	CTTAATTAAC	AATTGACCGG	TAATAATAGG	3900
ACCACCGTCG	TCCGGAACCG	CGCGGCCTAG	GAATTAATTG	TTAACTGGCC	ATTATTATCC	3900

FIG.13B-5

pICAST OMN

TAGATAAGTG	ACTGATTAGA	TGCATTTTGA	CTAGATCCCT	CGACCAATTC	CGGTTATTTT	3960
ATCTATTCAC	TGACTAATCT	ACGTAAAGCT	GATCTAGGGA	GCTGGTTAAG	GCCAATAAAA	3960
CCACCATATT	GCCGTCTTTT	GGCAATGTGA	GGGCCCCGAA	ACCTGGCCCT	GTCTTCTTGA	4020
GGTGGTATAA	CGGCAGAAAA	CCGTTACACT	CCCGGGCCTT	TGGACCGGGA	CAGAAGAACT	4020
CGAGCATTC	TAGGGGTCTT	TCCCCTCTCG	CCAAAGGAAT	GCAAGGTCTG	TTGAATGTCG	4080
GCTCGTAAGG	ATCCCCAGAA	AGGGGAGAGC	GGTTTCCTTA	CGTTCCAGAC	AACTTACAGC	4080
TGAAGGAAGC	AGTTCCTCTG	GAAGCTTCTT	GAAGACAAAC	AACGTCTGTA	GCGACCCCTT	4140
ACTTCCTTCG	TCAAGGAGAC	CTTCGAAGAA	CTTCTGTTTG	TTGCAGACAT	CGCTGGGAAA	4140
GCAGGCAGCG	GAACCCCCCA	CCTGGCGACA	GGTGCCTCTG	CGGCCAAAAG	CCACGTGTAT	4200
CGTCCGTCGC	CTTGGGGGGT	GGACCGCTGT	CCACGGAGAC	GCCGGTTTTT	GGTGCACATA	4200
AAGATACACC	TGCAAAGGCG	GCACAACCCC	AGTGCCACGT	TGTGAGTTGG	ATAGTTGTGG	4260
TTCTATGTGG	ACGTTTCCGC	CGTGTGTTGG	TCACGGTGCA	AACTCAACC	TATCAACACC	4260
AAAGAGTCAA	ATGGCTCTCC	TCAAGCGTAT	TCAACAAGGG	GCTGAAGGAT	GCCCAGAAGG	4320
TTTCTCAGTT	TACCGAGAGG	AGTTCGCATA	AGTTGTTCCC	CGACTTCCTA	CGGGTCTTCC	4320
TACCCCATTT	TATGGGATCT	GATCTGGGGC	CTCGGTGCAC	ATGCTTTACA	TGTGTTTAGT	4380
ATGGGGTAAC	ATACCCTAGA	CTAGACCCCG	GAGCCACGTG	TACGAAATGT	ACACAAATCA	4380
CGAGGTAAAA	AAACGTCTAG	GCCCCCGGAA	CCACGGGGAC	GTGGTTTTCC	TTTGAAAAAC	4440
GCTCCAATTT	TTTGAGATC	CGGGGGGCTT	GGTGCCCTG	CACCAAAGG	AAACTTTTTG	4440
ACGATGATAA	TACCATGAAA	AAGCCTGAAC	TCACGCGAC	GTCTGTCGAG	AAGTTTCTGA	4500
TGCTACTATT	ATGGTACTTT	TTCGGACTTG	AGTGGCGCTG	CAGACAGCTC	TTCAAAGACT	4500
TCGAAAAGTT	CGACAGCGTC	TCCGACCTGA	TGCAGCTCTC	GGAGGGCGAA	GAATCTCGTG	4560
AGCTTTTCAA	GCTGTCGAG	AGGCTGGACT	ACGTCGAGAG	CCTCCCGCTT	CTTAGAGCAC	4560
CTTTCAGCTT	CGATGTAGGA	GGGCGTGGAT	ATGTCCTGCG	GGTAAATAGC	TGCGCCGATG	4620
GAAAGTCGAA	GCTACATCCT	CCCGCACCTA	TACAGGACGC	CCATTTATCG	ACGCGGCTAC	4620
GTTTCTACAA	AGATCGTTAT	GTTTATCGGC	ACTTTGCATC	GGCCGCGCTC	CCGATTCCGG	4680
CAAAGATGTT	TCTAGCAATA	CAAATAGCCG	TGAAACGTAG	CCGGCGCGAG	GGCTAAGGCC	4680

FIG.13B-6

pICAST OMN

AAGTGCTTGA	CATTGGGGAA	TTTAGCGAGA	GCCTGACCTA	TTGCATCTCC	CGCCGTGCAC	4740
TTCACGAACT	GTAACCCCTT	AAATCGCTCT	CGGACTGGAT	AACGTAGAGG	GCGGCACGTG	4740
AGGGTGTAC	GTTGCAAGAC	CTGCCTGAAA	CCGAAGTGCC	CGCTGTTCTG	CAGCCGGTCG	4800
TCCCACAGTG	CAACGTTCTG	GACGGACTTT	GGCTTGACGG	GCGACAAGAC	GTCGGCCAGC	4800
CGGAGGCCAT	GGATGCGATC	GCTGCGGCCG	ATCTTAGCCA	GACGAGCGGG	TTCGGCCCAT	4860
GCCTCCGGTA	CCTACGCTAG	CGACGCCGGC	TAGAATCGGT	CTGCTCGCCC	AAGCCGGGTA	4860
TCGGACCGCA	AGGAATCGGT	CAATACACTA	CATGGCGTGA	TTTCATATGC	GCGATTGCTG	4920
AGCCTGGCGT	TCCTTAGCCA	GTTATGTGAT	GTACCGCACT	AAAGTATACG	CGCTAACGAC	4920
ATCCCATGT	GTATCACTGG	CAAAGTGTGA	TGGACGACAC	CGTCAGTGCG	TCCGTCGCGC	4980
TAGGGGTACA	CATAGTGACC	GTTTGACACT	ACCTGCTGTG	GCAGTCACGC	AGGCAGCGCG	4980
AGGCTCTCGA	TGAGCTGATG	CTTTGGGCCG	AGGACTGCCC	CGAAGTCCGG	CACCTCGTGC	5040
TCCGAGAGCT	ACTCGACTAC	GAAACCCGGC	TCCTGACGGG	GCTTCAGGCC	GTGGAGCACG	5040
ACGCGGATTT	CGGCTCCAAC	AATGTCCTGA	CGGACAATGG	CCGCATAACA	GCGGTCATTG	5100
TGCGCCTAAA	GCCGAGGTTG	TTACAGGACT	GCCTGTTACC	GGCGTATTGT	CGCCAGTAAC	5100
ACTGGAGCGA	GGCGATGTTT	GGGGATTCCC	AATACGAGGT	CGCCAACATC	TTCTTCTGGA	5160
TGACCTCGCT	CCGCTACAAG	CCCCTAAGGG	TTATGCTCCA	GCGGTTGTAG	AAGAAGACCT	5160
GGCCGTGGTT	GGCTTGTATG	GAGCAGCAGA	CGCGCTACTT	CGAGCGGAGG	CATCCGGAGC	5220
CCGGCACCAA	CCGAACATAC	CTCGTCGTCT	GCGCGATGAA	GCTCGCCTCC	GTAGGCCTCG	5220
TTGCAGGATC	GCCGCGGCTC	CGGGCGTATA	TGCTCCGCAT	TGGTCTTGAC	CAACTCTATC	5280
AACGTCCTAG	CGGCGCCGAG	GCCCGCATAT	ACGAGGCGTA	ACCAGAACTG	GTTGAGATAG	5280
AGAGCTTGGT	TGACGGCAAT	TTCGATGATG	CAGCTTGGGC	GCAGGGTCGA	TGCGACGCAA	5340
TCTCGAACCA	ACTGCCGTTA	AAGCTACTAC	GTCGAACCCG	CGTCCCAGCT	ACGCTGCGTT	5340
TCGTCCGATC	CGGAGCCGGG	ACTGTCGGGC	GTACACAAAT	CGCCCGCAGA	AGCGCGGCCG	5400
AGCAGGCTAG	GCCTCGGCCC	TGACAGCCCG	CATGTGTTTA	GCGGGCGTCT	TCGCGCCGGC	5400
TCTGGACCGA	TGGCTGTGTA	GAAGTACTCG	CCGATAGTGG	AAACCGACGC	CCCAGCACTC	5460
AGACCTGGCT	ACCGACACAT	CTTCATGAGC	GGCTATCACC	TTTGGCTGCG	GGGTCGTGAG	5460

FIG. 13B-7

pICAST OMN

GTCCGAGGGC	AAAGGAATAG	AGTAGATGCC	GACCGGGATC	TATCGATAAA	ATAAAAGATT	5520
CAGGCTCCCG	TTTCCTTATC	TCATCTACGG	CTGGCCCTAG	ATAGCTATTT	TATTTTCTAA	5520
TTATTTAGTC	TCCAGAAAAA	GGGGGGAATG	AAGACCCCAA	CCTGTAGGTT	TGGCAAGCTA	5580
AATAAATCAG	AGGTCTTTTT	CCCCCTTAC	TTTCTGGGGT	GGACATCCAA	ACCGTTCGAT	5580
GCTTAAGTAA	CGCCATTTTG	CAAGGCATGG	AAAAATACAT	AACTGAGAAT	AGAGAAGTTC	5640
CGAATTCATT	GCGGTAAAC	GTTCCGTACC	TTTTTATGTA	TTGACTCTTA	TCTCTTCAAG	5640
AGATCAAGGT	CAGGAACAGA	TGGAACAGCT	GAATATGGGC	CAAACAGGAT	ATCTGTGGTA	5700
TCTAGTTCCA	GTCCTTGTCT	ACCTTGTCGA	CTTATACCCG	GTTTGTCTTA	TAGACACCAT	5700
AGCAGTTCCT	GCCCCGGCTC	AGGGCCAAGA	ACAGATGGAA	CAGCTGAATA	TGGGCCAAAC	5760
TCGTCAAGGA	CGGGGCCGAG	TCCCGGTTCT	TGTCTACCTT	GTCGACTTAT	ACCCGGTTTG	5760
AGGATATCTG	TGGTAAGCAG	TTCCTGCCCC	GGCTCAGGGC	CAAGAACAGA	TGGTCCCCAG	5820
TCCTATAGAC	ACCATTCGTC	AAGGACGGGG	CCGAGTCCCG	GTTCTTGTCT	ACCAGGGGTC	5820
ATGCGGTCCA	GCCCTCAGCA	GTTTCTAGAG	AACCATCAGA	TGTTTCCAGG	GTGCCCCAAG	5880
TACGCCAGGT	CGGGAGTCGT	CAAAGATCTC	TTGGTAGTCT	ACAAAGGTCC	CACGGGGTTC	5880
GACCTGAAAT	GACCCTGTGC	CTTATTTGAA	CTAACCAATC	AGTTCGCTTC	TCGCTTCTGT	5940
CTGGACTTTA	CTGGGACACG	GAATAAACTT	GATTGGTTAG	TCAAGCGAAG	AGCGAAGACA	5940
TCGCGCGCTT	CTGCTCCCCG	AGCTCAATAA	AAGAGCCAC	AACCCCTCAC	TCGGGGCGCC	6000
AGCGCGCGAA	GACGAGGGGC	TCGAGTTATT	TTCTCGGGTG	TTGGGGAGTG	AGCCCCGCGG	6000
AGTCCTCCGA	TTGACTGAGT	CGCCCGGGTA	CCCGTGTATC	CAATAAACCC	TCTTGCAGTT	6060
TCAGGAGGCT	AACTGACTCA	GCGGGCCCAT	GGGCACATAG	GTTATTTGGG	AGAACGTCAA	6060
GCATCCGACT	TGTGGTCTCG	CTGTTCTTG	GGAGGGTCTC	CTCTGAGTGA	TTGACTACCC	6120
CGTAGGCTGA	ACACCAGAGC	GACAAGGAAC	CCTCCAGAG	GAGACTCACT	AACTGATGGG	6120
GTCAGCGGGG	GTCTTTCATT	CATGCAGCAT	GTATCAAAAT	TAATTTGGTT	TTTTTCTTA	6180
CAGTCGCCCC	CAGAAAGTAA	GTACGTCGTA	CATAGTTTTA	ATTAAACCAA	AAAAAAGAAT	6180
AGTATTTACA	TTAAATGGCC	ATAGTTGCAT	TAATGAATCG	GCCAACGCGC	GGGGAGAGGC	6240
TCATAAATGT	AATTTACCGG	TATCAACGTA	ATTACTTAGC	CGGTTGCGCG	CCCCTCTCCG	6240

FIG. 13B-8

pICAST OMN

GGTTTGC GTA	TTGGCGCTCT	TCCGCTTCCT	CGCTCACTGA	CTCGCTGCGC	TCGGTCGTTT	6300
CCAAACGCAT	AACCGCGAGA	AGGCGAAGGA	GCGAGTGACT	GAGCGACGCG	AGCCAGCAAG	6300
GGCTGCGGCG	AGCGGTATCA	GCTCACTCAA	AGGCGGTAAT	ACGGTTATCC	ACAGAATCAG	6360
CCGACGCCGC	TCGCCATAGT	CGAGTGAGTT	TCCGCCATTA	TGCCAATAGG	TGTCTTAGTC	6360
GGGATAACGC	AGGAAAGAAC	ATGTGAGCAA	AAGGCCAGCA	AAAGGCCAGG	AACCGTAAAA	6420
CCCTATTGCG	TCCTTTCTTG	TACACTCGTT	TTCCGGTCGT	TTTCCGGTCC	TTGGCATTTT	6420
AGGCCGCGTT	GCTGGCGTTT	TTCCATAGGC	TCCGCCCCC	TGACGAGCAT	CACAAAAATC	6480
TCCGGCGCAA	CGACCGCAA	AAGGTATCCG	AGGCGGGGG	ACTGCTCGTA	GTGTTTTTAG	6480
GACGCTCAAG	TCAGAGGTGG	CGAAACCCGA	CAGGACTATA	AAGATACCAG	GCGTTTCCCC	6540
CTGCGAGTTC	AGTCTCCACC	GCTTTGGGCT	GTCCTGATAT	TTCTATGGTC	CGCAAAGGGG	6540
CTGGAAGCTC	CCTCGTGCGC	TCTCCTGTTC	CGACCCTGCC	GCTTACCGGA	TACCTGTCCG	6600
GACCTTCGAG	GGAGCACGCG	AGAGGACAAG	GCTGGGACGG	CGAATGGCCT	ATGGACAGGC	6600
CCTTTCTCCC	TTCGGGAAGC	GTGGCGCTTT	CTCATAGCTC	ACGCTGTAGG	TATCTCAGTT	6660
GGAAAGAGGG	AAGCCCTTCG	CACCGCGAAA	GAGTATCGAG	TGCGACATCC	ATAGAGTCAA	6660
CGGTGTAGGT	CGTTCGCTCC	AAGCTGGGCT	GTGTGCACGA	ACCCCCCGTT	CAGCCCGACC	6720
GCCACATCCA	GCAAGCGAGG	TTGACCCGA	CACACGTGCT	TGGGGGGCAA	GTCGGGCTGG	6720
GCTGCGCCTT	ATCCGGTAAC	TATCGTCTTG	AGTCCAACCC	GGTAAGACAC	GACTTATCGC	6780
CGACGCGGAA	TAGGCCATTG	ATAGCAGAAC	TCAGGTTGGG	CCATTCTGTG	CTGAATAGCG	6780
CACTGGCAGC	AGCCACTGGT	AACAGGATTA	GCAGAGCGAG	GTATGTAGGC	GGTGCTACAG	6840
GTGACCGTCG	TCGGTGACCA	TTGTCCTAAT	CGTCTCGCTC	CATACATCCG	CCACGATGTC	6840
AGTTCTTGAA	GTGGTGGCCT	AACTACGGCT	ACACTAGAAG	AACAGTATTT	GGTATCTGCG	6900
TCAAGAACTT	CACCACCGGA	TTGATGCCGA	TGTGATCTTC	TTGTCATAAA	CCATAGACGC	6900
CTCTGCTGAA	GCCAGTTACC	TTCGGAAAAA	GAGTTGGTAG	CTCTTGATCC	GGCAAACAAA	6960
GAGACGACTT	CGGTCAATGG	AAGCCTTTTT	CTCAACCATC	GAGAACTAGG	CCGTTTGTTT	6960
CCACCGCTGG	TAGCGGTGGT	TTTTTTGTTT	GCAAGCAGCA	GATTACGCGC	AGAAAAAAG	7020
GGTGGCGACC	ATCGCCACCA	AAAAAACAAA	CGTTCGTCGT	CTAATGCGCG	TCTTTTTTTC	7020

FIG.13B-9

pICAST OMN

GATCTCAAGA	AGATCCTTTG	ATCTTTTCTA	CGGGGTCTGA	CGCTCAGTGG	AACGAAAAC	7080
CTAGAGTTCT	TCTAGGAAAC	TAGAAAAGAT	GCCCCAGACT	GCGAGTCACC	TTGCTTTTGA	7080
CACGTTAAGG	GATTTTGGTC	ATGAGATTAT	CAAAAAGGAT	CTTCACCTAG	ATCCTTTTGC	7140
GTGCAATTCC	CTAAAACCAG	TACTCTAATA	GTTTTTCCTA	GAAGTGGATC	TAGGAAAACG	7140
GGCCGCAAAT	CAATCTAAAG	TATATATGAG	TAAACTTGGT	CTGACAGTTA	CCAATGCTTA	7200
CCGGCGTTTA	GTTAGATTTC	ATATATACTC	ATTTGAACCA	GA CTGTCAAT	GGTTACGAAT	7200
ATCAGTGAGG	CACCTATCTC	AGCGATCTGT	CTATTTCGTT	CATCCATAGT	TGCCTGACTC	7260
TAGTCACTCC	GTGGATAGAG	TCGCTAGACA	GATAAAGCAA	G TAGGTATCA	ACGGACTGAG	7260
CCCGTCGTGT	AGATAACTAC	GATACGGGAG	GGCTTACCAT	CTGGCCCCAG	TGCTGCAATG	7320
GGGCAGCACA	TCTATTGATG	CTATGCCCTC	CCGAATGGTA	GACCGGGGTC	ACGACGTTAC	7320
ATACCGCGAG	ACCCACGCTC	ACCGGCTCCA	GATTTATCAG	CAATAAACCA	GCCAGCCGGA	7380
TATGGCGCTC	TGGGTGCGAG	TGGCCGAGGT	CTAAATAGTC	GTTATTTGGT	CGGTCGGCCT	7380
AGGGCCGAGC	GCAGAAGTGG	TCCTGCAACT	TTATCCGCCT	CCATCCAGTC	TATTAATTGT	7440
TCCCGGCTCG	CGTCTTCACC	AGGACGTTGA	AATAGGCGGA	GGTAGGTCAG	ATAATTAACA	7440
TGCCGGGAAG	CTAGAGTAAG	TAGTTCGCCA	GTTAATAGTT	TGCGCAACGT	TGTTGCCATT	7500
ACGGCCCTTC	GATCTCATTC	ATCAAGCGGT	CAATTATCAA	ACGCGTTGCA	ACAACGGTAA	7500
GCTACAGGCA	TCGTGGTGTC	ACGCTCGTCG	TTTGGTATGG	CTTCATT CAG	CTCCGGTTCC	7560
CGATGTCCGT	AGCACCACAG	TGCGAGCAGC	AAACCATACC	GAAGTAAGTC	GAGGCCAAGG	7560
CAACGATCAA	GGCGAGTTAC	ATGATCCCCC	ATGTTGTGCA	AAAAAGCGGT	TAGCTCCTTC	7620
GTTGCTAGTT	CCGCTCAATG	TACTAGGGGG	TACAACACGT	TTTTTCGCCA	ATCGAGGAAG	7620
GGTCCTCCGA	TCGTTGTCAG	AAGTAAGTTG	GCCGCAGTGT	TATCACTCAT	GGTTATGGCA	7680
CCAGGAGGCT	AGCAACAGTC	TTCATTCAAC	CGGCGTCACA	ATAGTGAGTA	CCAATACCGT	7680
GCACTGCATA	ATTCTCTTAC	TGTCATGCCA	TCCGTAAGAT	GCTTTTCTGT	GA CTGGTGAG	7740
CGTGACGTAT	TAAGAGAAATG	ACAGTACGGT	AGGCATTCTA	CGAAAAGACA	CTGACCACTC	7740
TACTCAACCA	AGTCATTCTG	AGAATAGTGT	ATGCGGCGAC	CGAGTTGCTC	TTGCCC GGCG	7800
ATGAGTTGGT	TCAGTAAGAC	TCTTATCACA	TACGCCGCTG	GCTCAACGAG	AACGGGCCGC	7800

FIG.13B-10

pICAST OMN

TCAATACGGG	ATAATACCGC	GCCACATAGC	AGAACTTTAA	AAGTGCTCAT	CATTGGAAAA	7860
AGTTATGCCC	TATTATGGCG	CGGTGTATCG	TCTTGAAATT	TTCACGAGTA	GTAACCTTTT	7860
CGTTCTTCGG	GGCGAAAACT	CTCAAGGATC	TTACCGCTGT	TGAGATCCAG	TTCGATGTAA	7920
GCAAGAAGCC	CCGCTTTTGA	GAGTTCCTAG	AATGGCGACA	ACTCTAGGTC	AAGCTACATT	7920
CCCACTCGTG	CACCCAAGTG	ATCTTCAGCA	TCTTTTACTT	TCACCAGCGT	TTCTGGGTGA	7980
GGGTGAGCAC	GTGGGTTGAC	TAGAAGTCGT	AGAAAATGAA	AGTGGTCGCA	AAGACCCACT	7980
GCAAAAACAG	GAAGGC AAAA	TGCCGCAAAA	AAGGGAATAA	GGGCGACACG	GAAATGTTGA	8040
CGTTTTTGTC	CTTCCGTTTT	ACGGCGTTTT	TTCCCTTATT	CCCGCTGTGC	CTTTACAAC T	8040
ATACTCATAC	TCTTCCTTTT	TCAATATTAT	TGAAGCATTT	ATCAGGGTTA	TTGTCTCATG	8100
TATGAGTATG	AGAAGGAAAA	AGTTATAATA	ACTTCGTAAA	TAGTCCCAAT	AACAGAGTAC	8100
AGCGGATACA	TATTTGAATG	TATTTAGAAA	AATAAACAAA	TAGGGGTTCC	GCGCACATTT	8160
TCGCCTATGT	ATAAACTTAC	ATAAATCTTT	TTATTTGTTT	ATCCCAAGG	CGCGTGTA AA	8160
C						8161
G						8161

FIG.13B-11

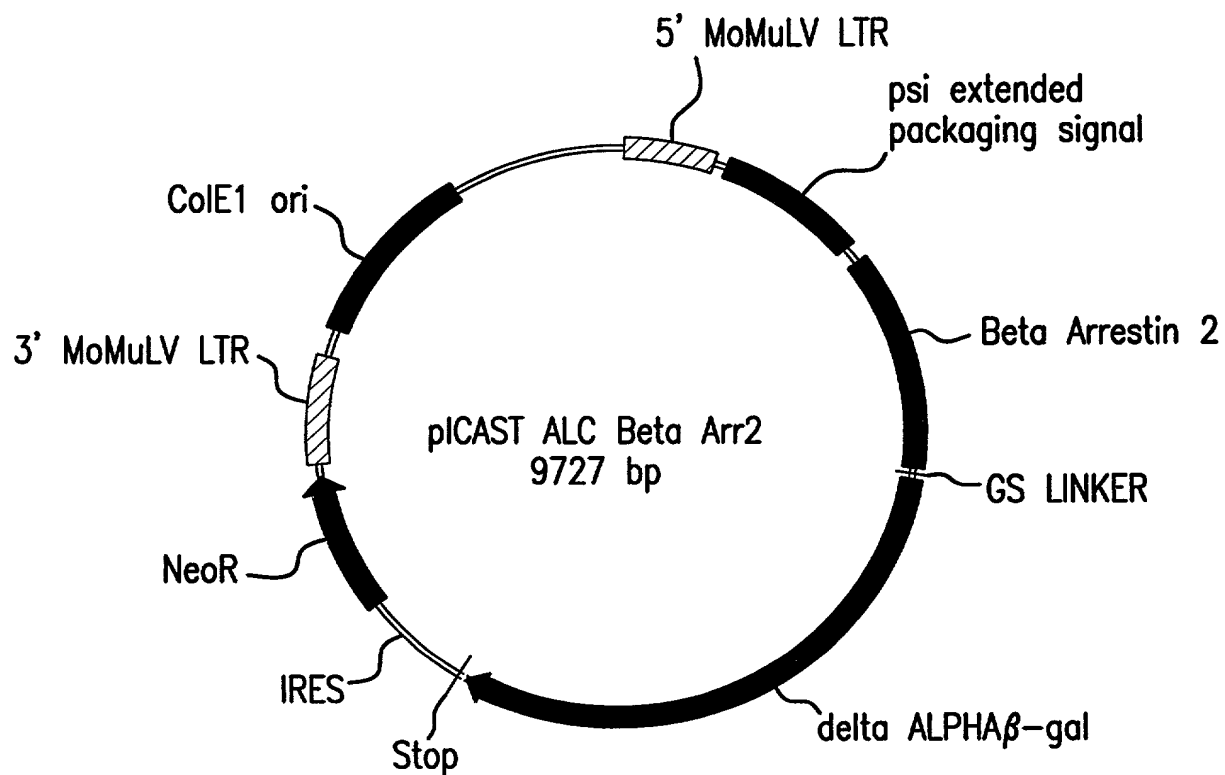


FIG.14

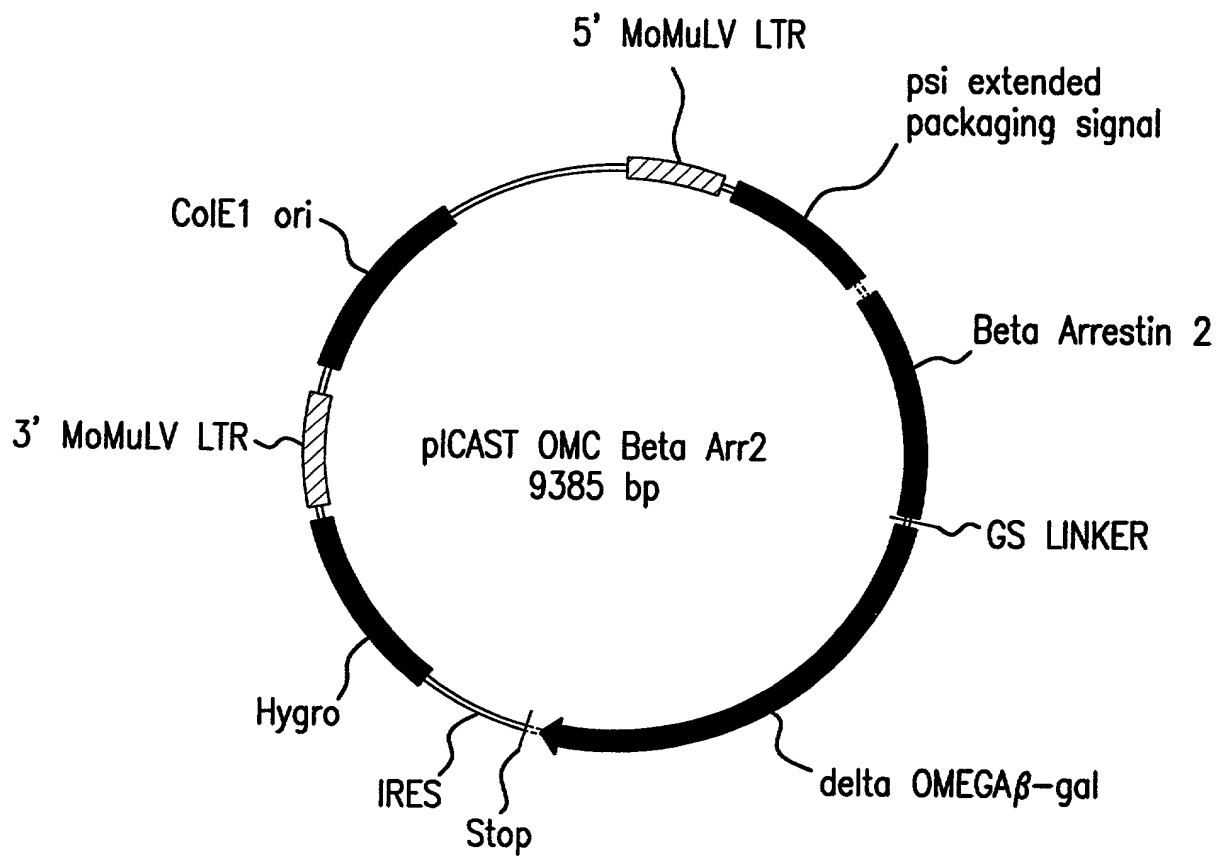


FIG.15

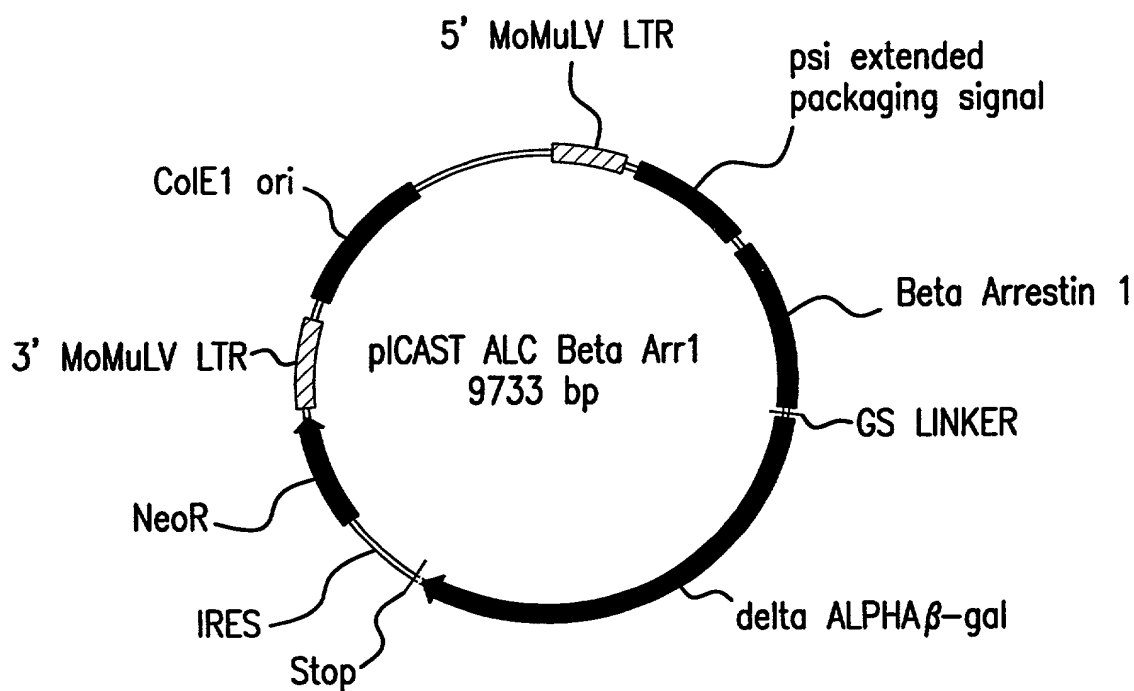


FIG. 16

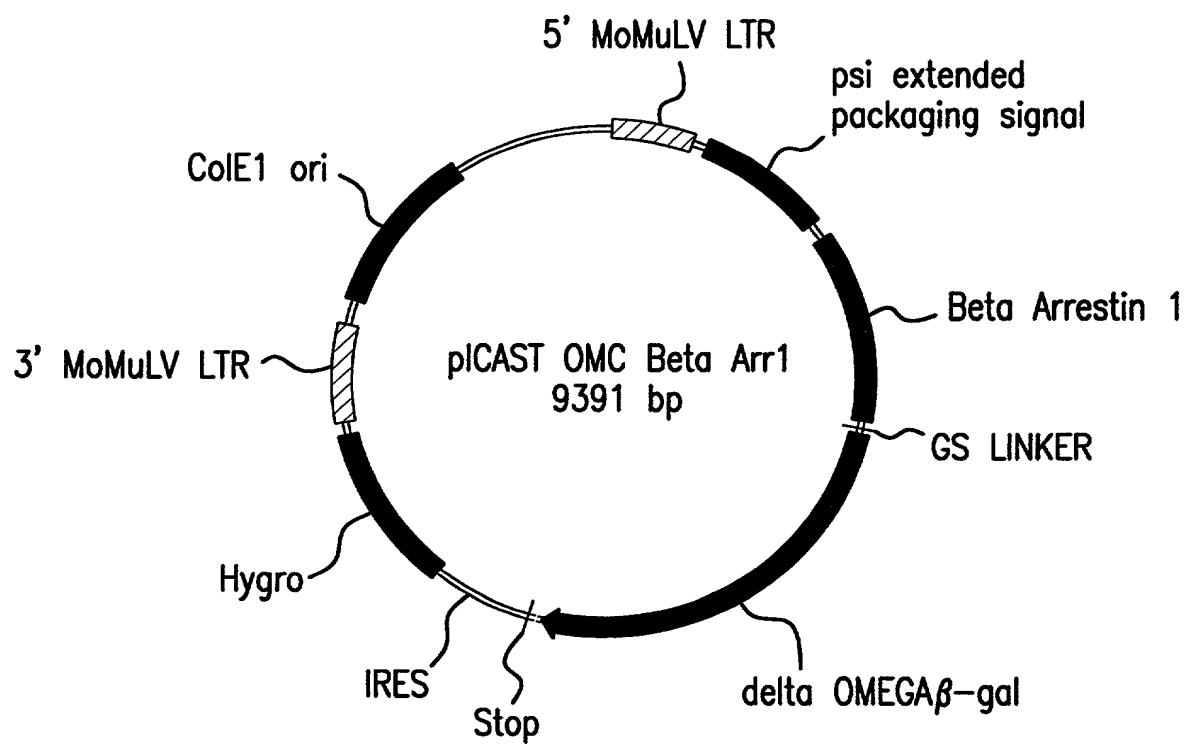


FIG.17

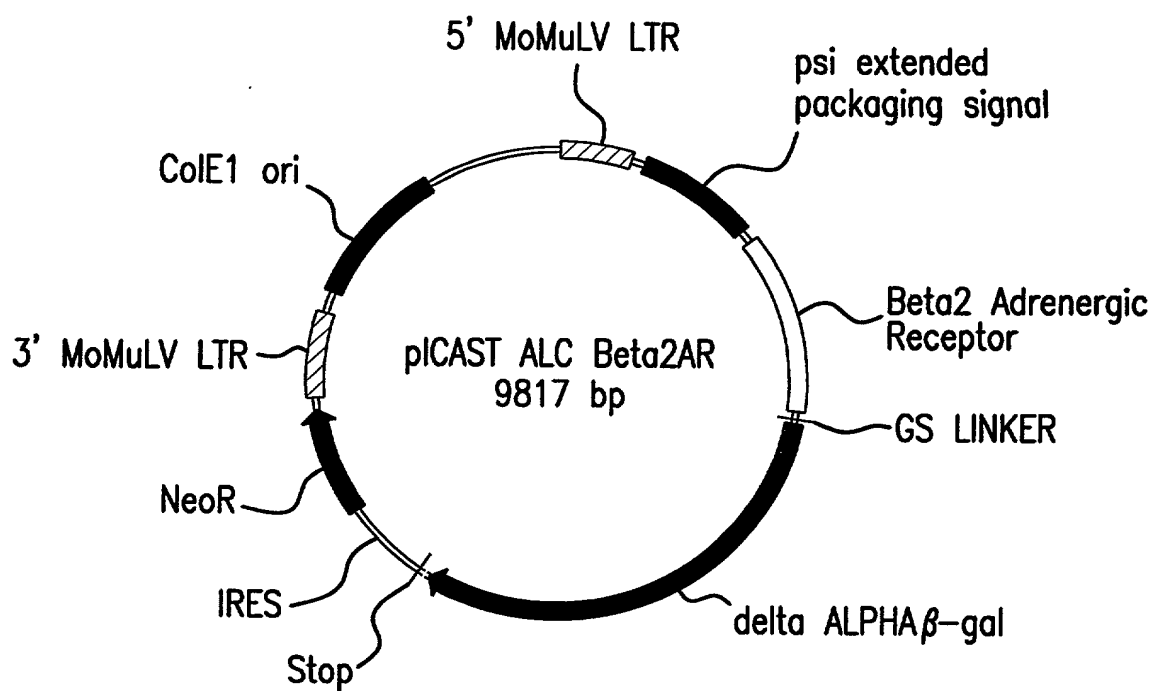


FIG.18

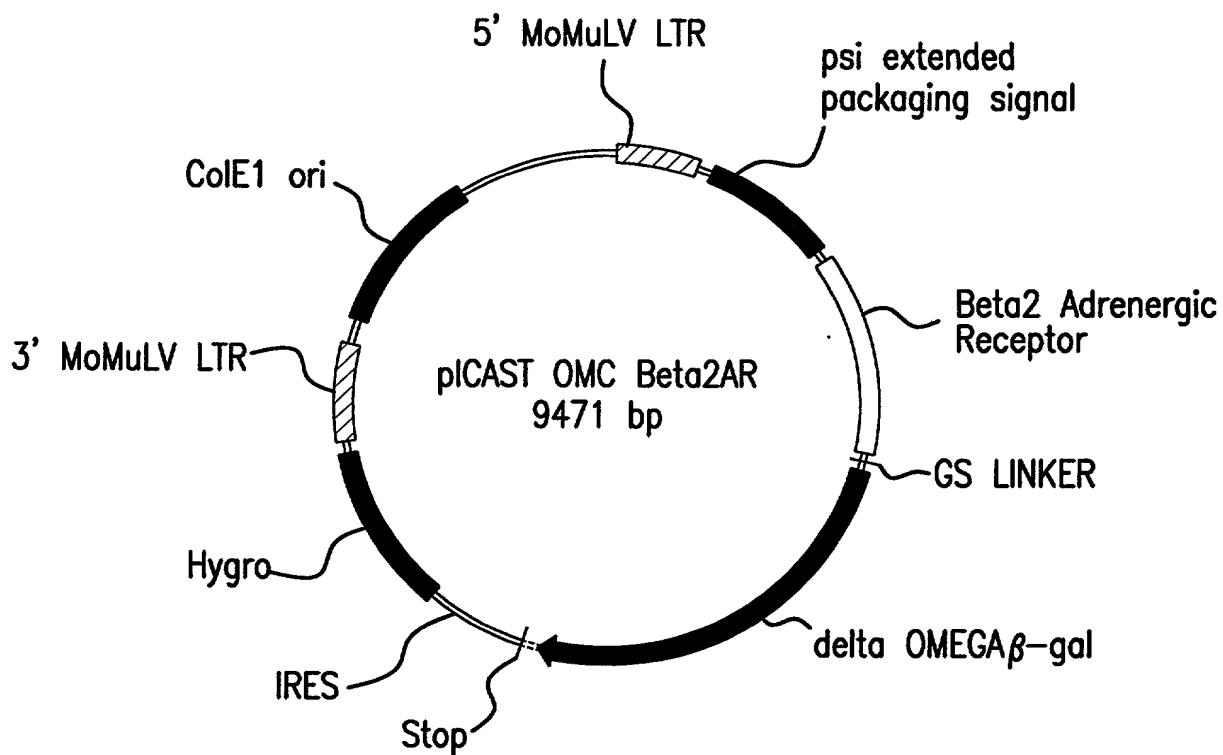


FIG.19

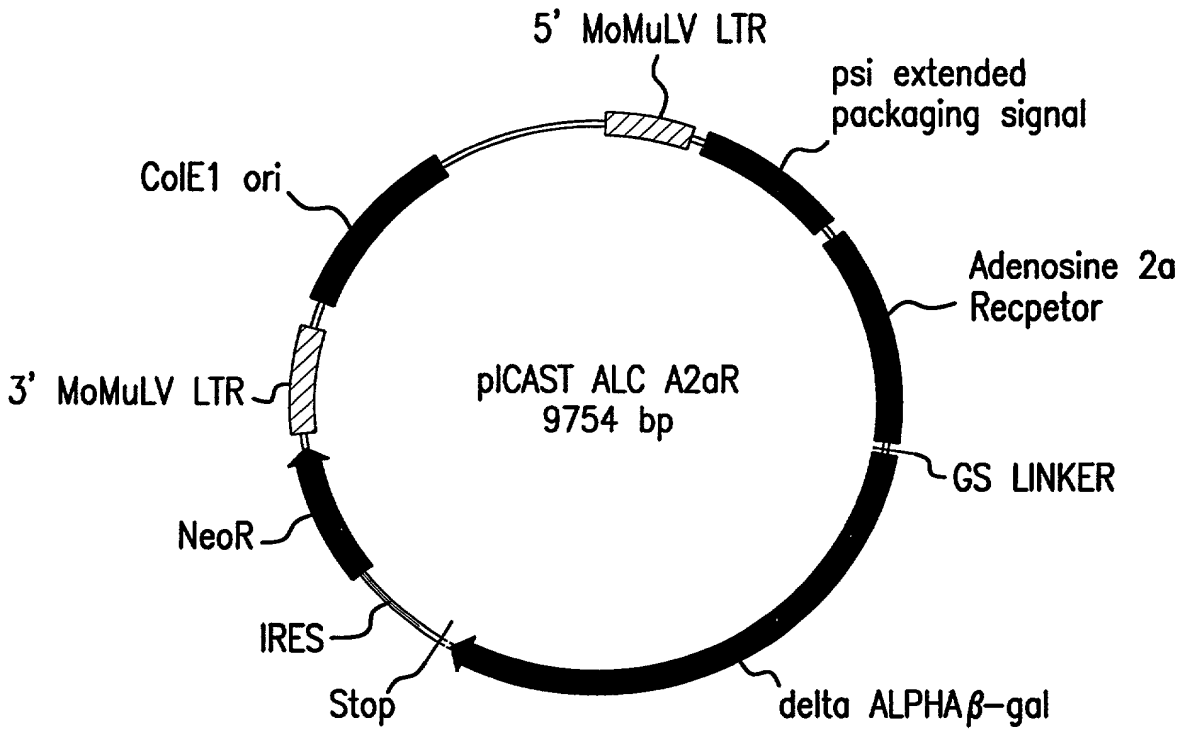


FIG.20

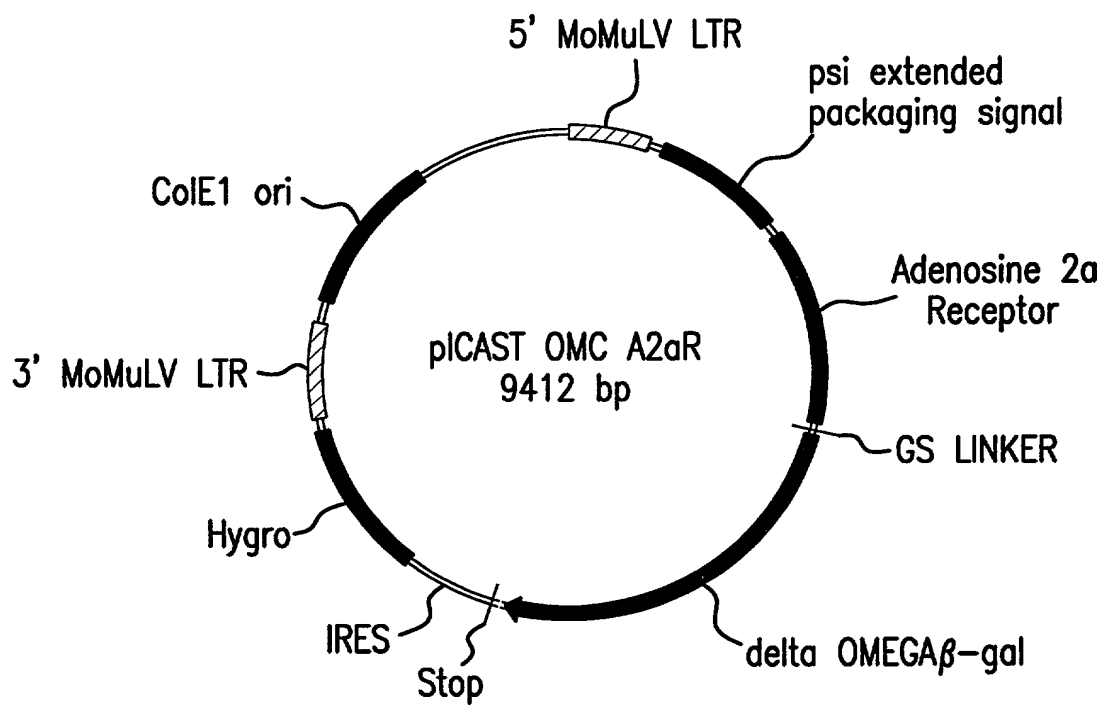


FIG.21

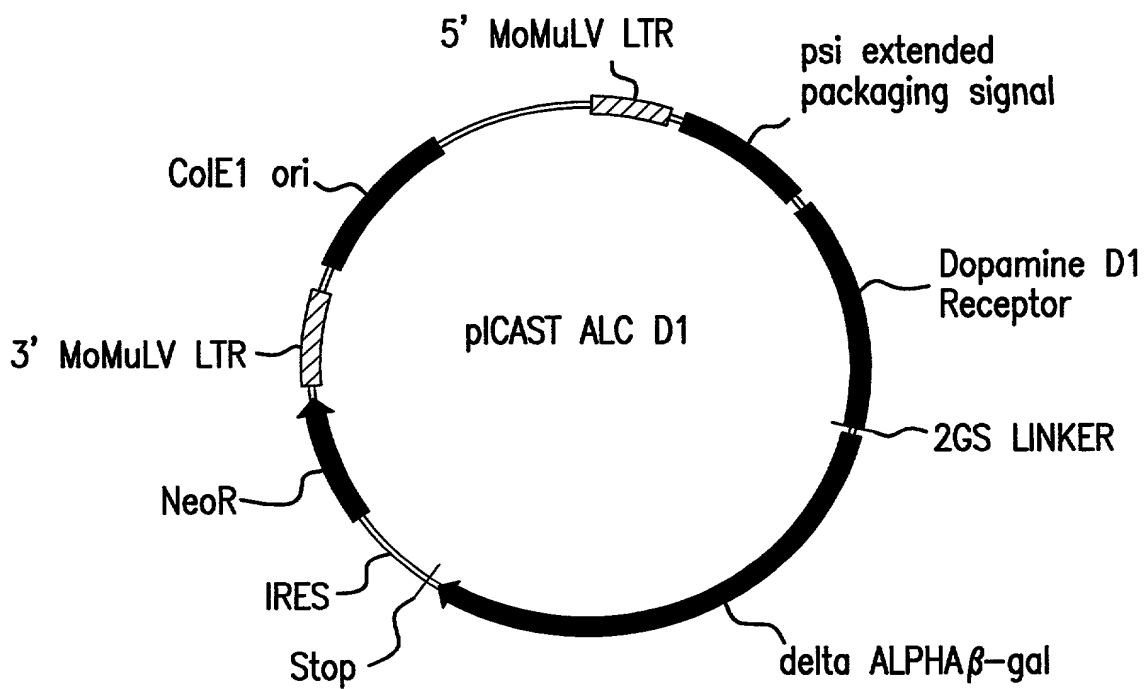


FIG.22

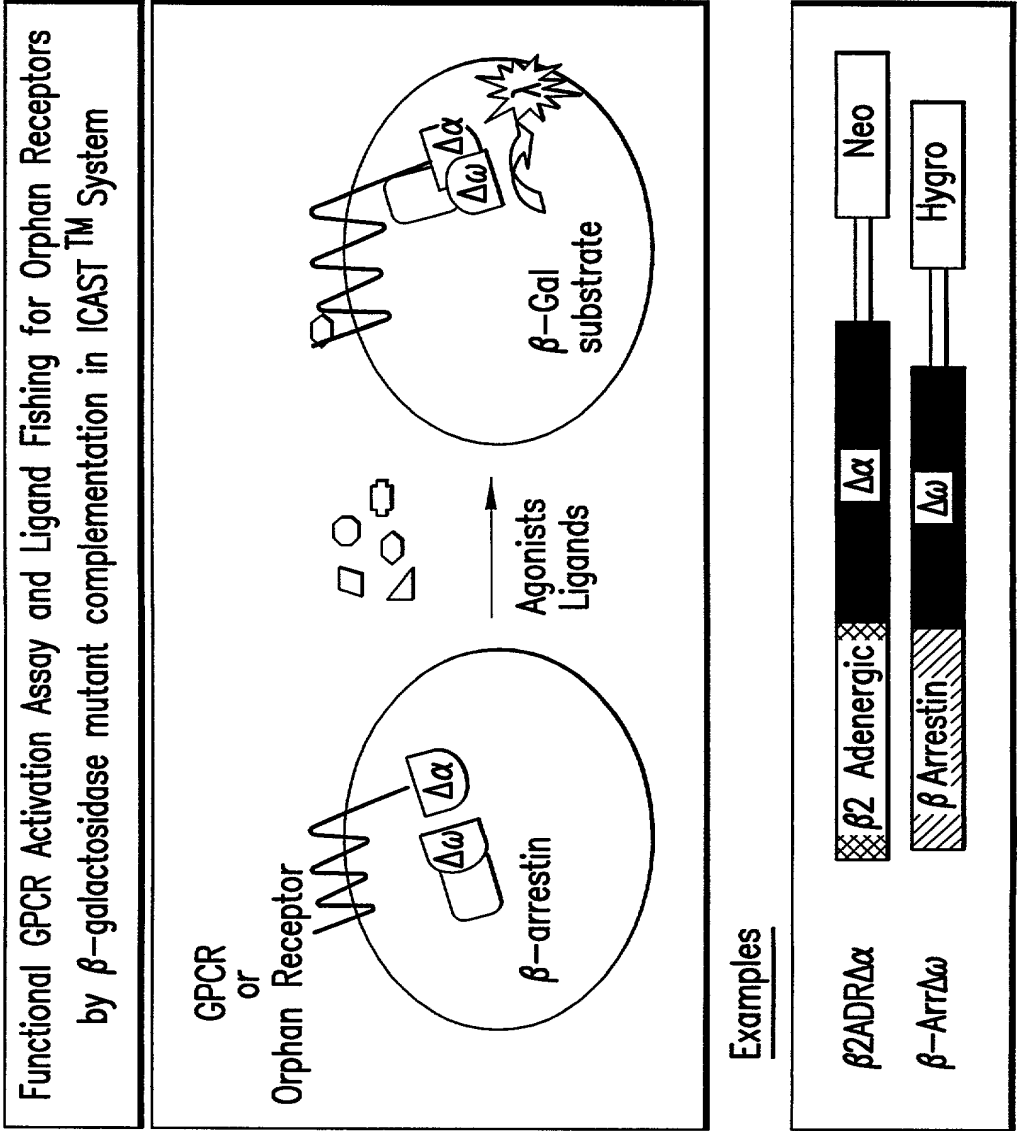
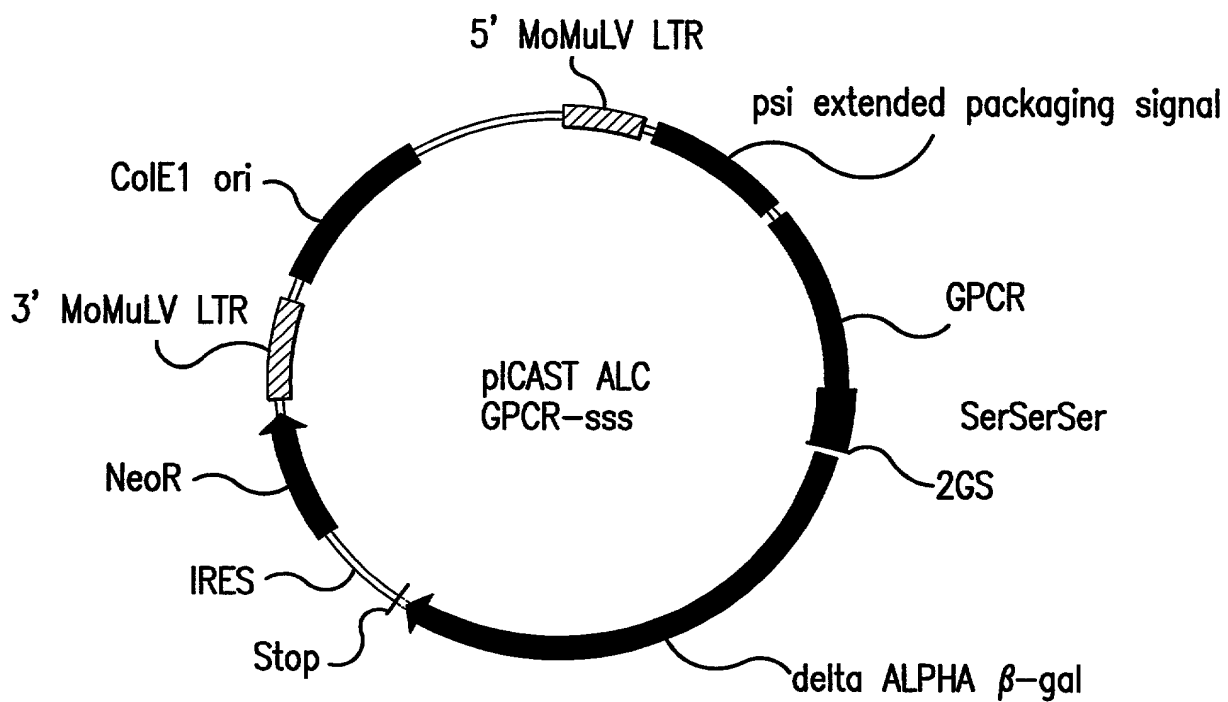
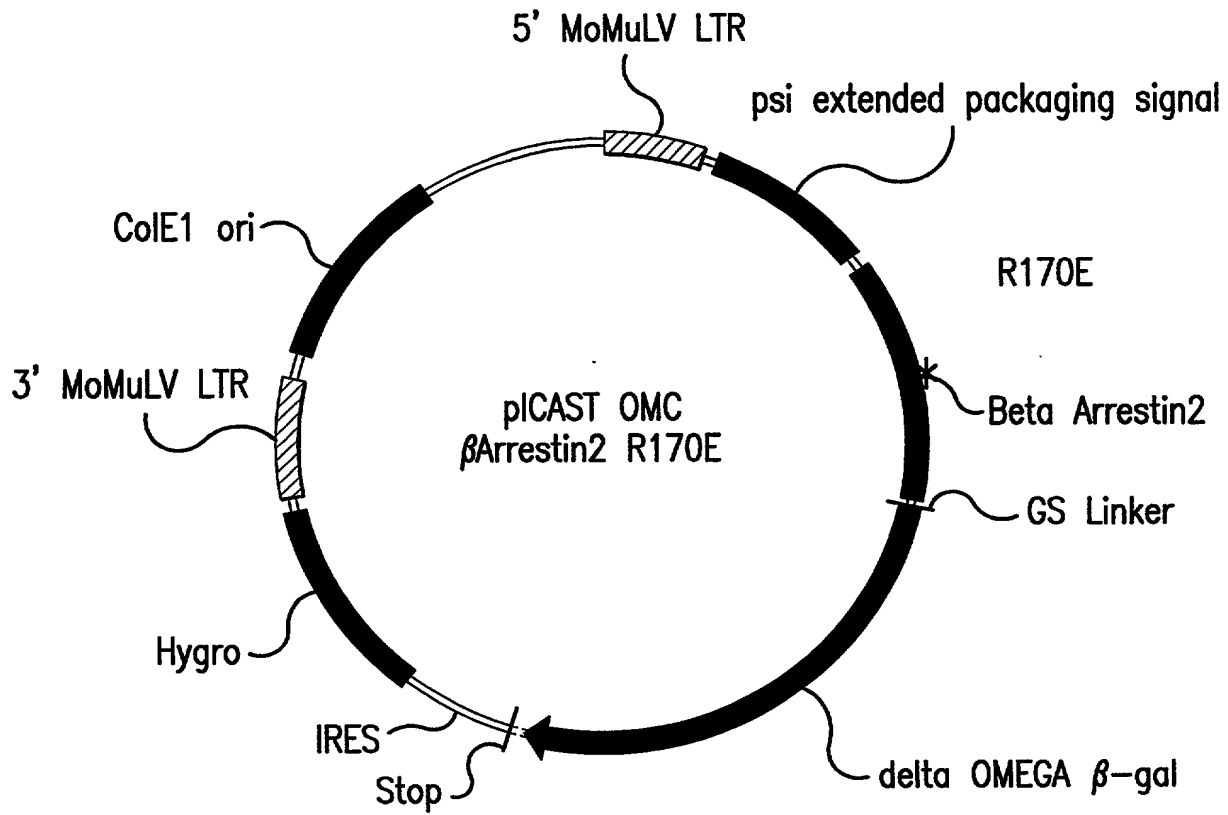


FIG. 23



Vector for Expression of a GPCR with inserted
Serine/Threonine amino acid sequences as a fusion with β -gal $\Delta\alpha$.

FIG. 24



Vector for Expression of mutant (R170E) β -arrestin2 as a fusion with β -gal $\Delta\omega$.

FIG. 25

Phosphorylation Insensitive Mutant R170E β -Arrestin2 $\Delta\omega$
 Binds to β 2 AR $\Delta\alpha$ in Response to Agonist Activation

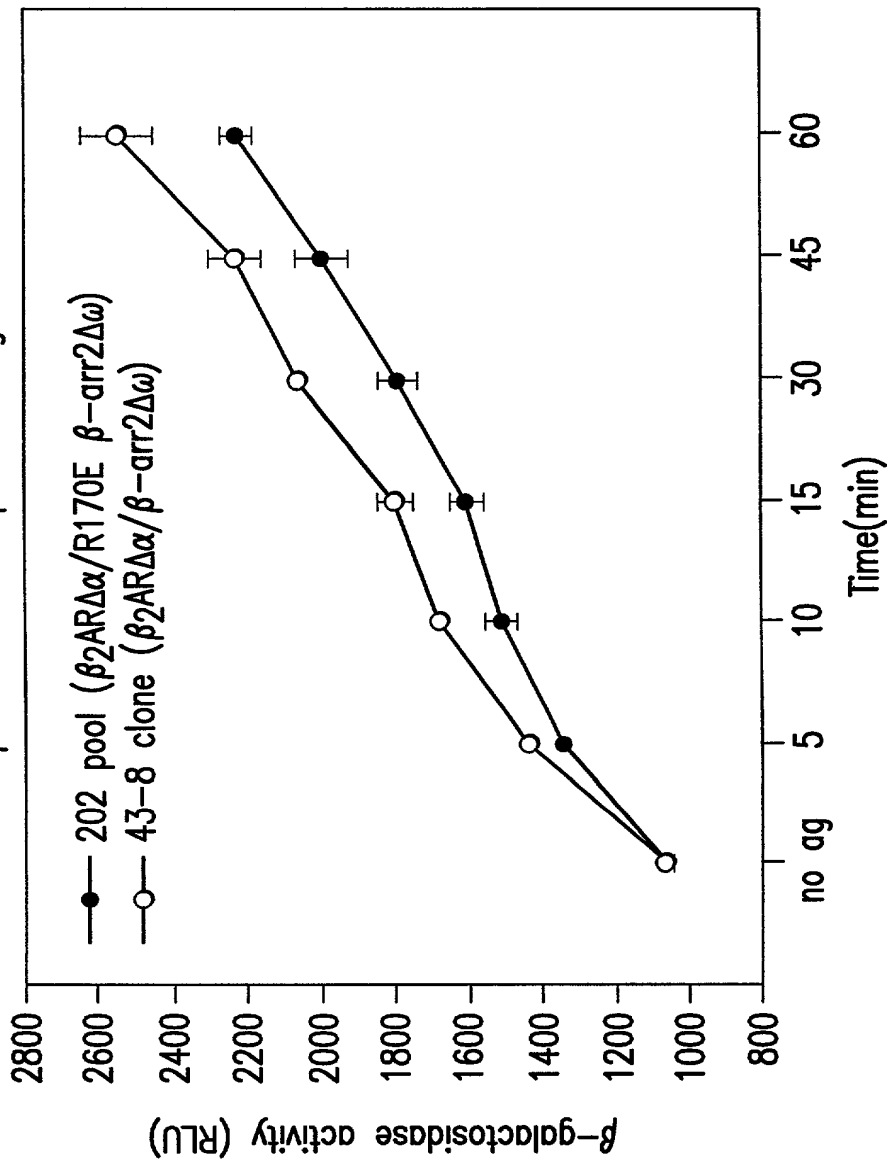
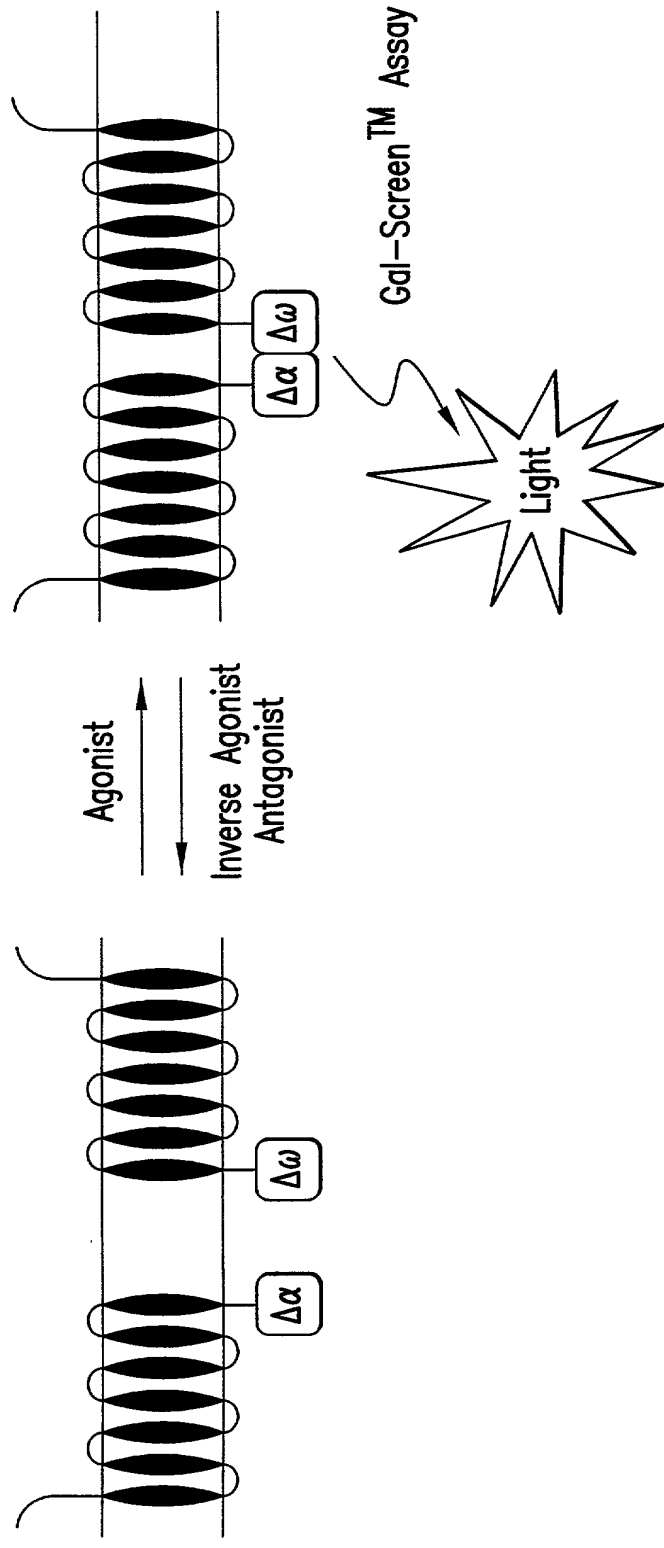


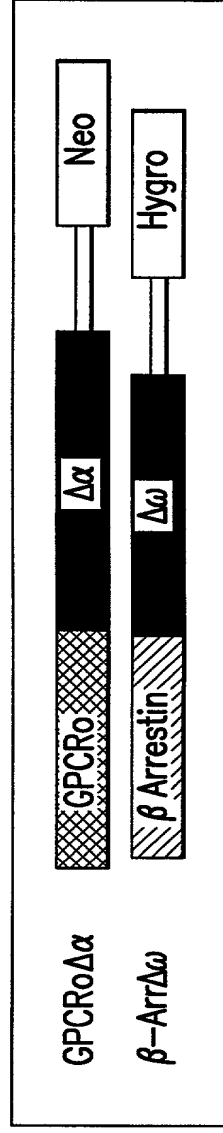
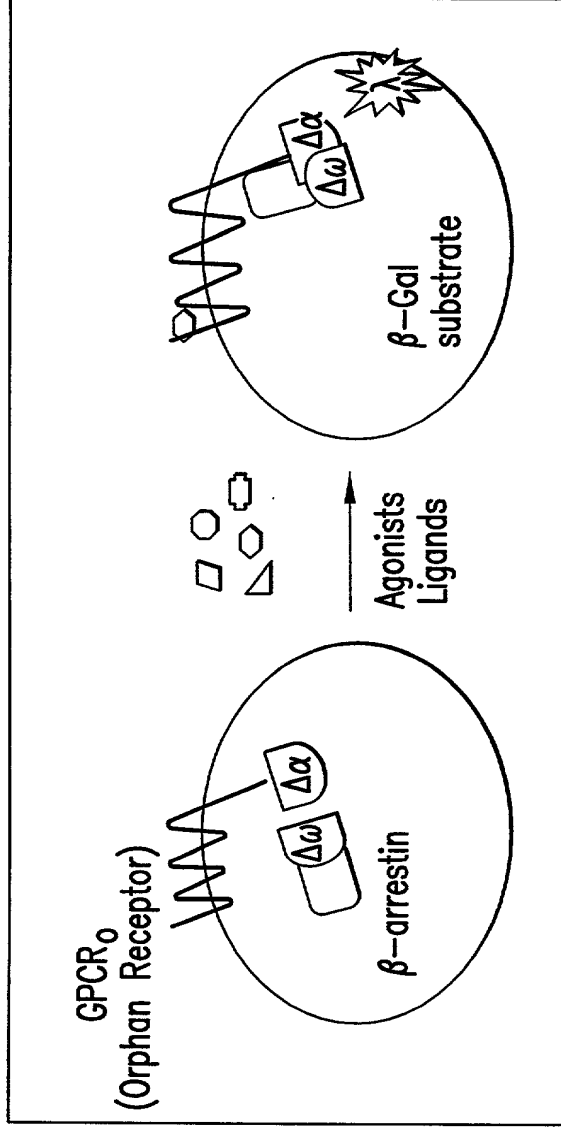
FIG. 26



GPCR dimerization measured by β -gal complementation

FIG. 27

Example-



Ligand Fishing for Orphan Receptors by β-galactosidase mutant
complementation in ICASTM System

FIG. 28